MANAGING UNCERTAINTY IN THE PROCESS OF GOING PUBLIC

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I hereby that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

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Abstract

This thesis explores the potential of novel mechanisms towards the reduction of issuers' ex ante uncertainty in the process of going public: i) the recruitment of directors with exceptional academic backgrounds and ii) obtaining credit ratings. Given the information scarcity in the private domain, IPO firms can use these strategies to provide investors with solid, readily identifiable benchmarks to assess their standing. Notwithstanding whether these informational cues are associated with positive or negative prospects, they cause a significant portion of uncertainty in valuation to subside. Ultimately, this should act to constrain the phenomenon of IPO underpricing causing firms to claim a larger portion of the surplus value created on the issue day.

First, we examine whether CEO educational and professional attainments are associated with short-run IPOs performance. We find that returns are negatively associated with Ivy-League education, the existence of at least one University degree and the total number of qualifications. After controlling for endogeneity and self-selection bias, the results show that at the graduate level of education the Master of Arts, the MBA, the Juris and Medical Doctor titles exhibit negative relation with the money left on the table. The same is true for any professional qualification. It is also reported that only in the case of the PhD title the Nobel Elite group of Universities outperforms the rest of the sample.

Second, we examine the effect of multiple credit ratings on IPO performance. The evidence comes from the U.S. and shows that the acquisition of credit ratings constitutes a valid investment decision for the issuing firm as it leaves less money on the table. Both individual as well as any combination of ratings from the three largest agencies associates with lower underpricing. This effect exacerbates with higher grade levels which are also found to decrease initial returns. Additionally, rated IPOs systematically experience negative filing price revisions. The results offer new insight to the facilitation of the going public process.

Finally, we contribute to the large literature associating IPOs with earnings management. In this respect, we explore a special niche, i.e. politically connected firms. A priori, these issuers can be expected to refrain from discretionary accruals manipulation to avoid causing discontent to their contacts. Alternatively, the case may be that the

powerful acquaintances fuel managers with overconfidence which permeates the financial statements. Assembling a hand-collected database on firms' political donations, we come up with strong support for the latter conjecture. In particular lobbying activity and candidate campaign financing are both shown to be among the important determinants of aggressiveness in reporting. Our findings tie in with a growing body of literature showing businesses actively involved in politics to be prone to abuses and professional misconduct.

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Chapter 1 – Introduction

1.1 Motivation and Theoretical Background

The main theme of this thesis is the sentiment of uncertainty accompanying Initial Public Offerings (IPO). This uncertainty has a multifaceted nature pertaining to the pricing and liquidity of the new securities as well as attaining adequate subscription from IPO investors. Because in the private domain firms need not conform to reporting requirements or engage in public disclosures, prospective buyers lack a prior record of data to relate to. Certo (2003) terms this situation as the 'market newness liability'. The negative framing is in accord with the colossal economic implications for issuers in terms of IPO underpricing: an opportunity cost resulting from a systematically higher closing price on the first day of trade. In numerical terms, Jay Ritter, the leading IPO authority, estimates on his website the aggregate cost of the positive skewness of the distribution of U.S. IPO returns at $ 150 billion.

IPO issuers in order to disseminate quality and above-par financial standing employ a variety of strategies. Accordingly, the literature reports the employment of market leading auditors and underwriters in the issuers' attempt to cause prestige spillovers (Beatty, 1989; Carter et al., 1998). An alternative means of aiming at certification can comprise affiliations with venture capital firms which already possess a record of taking companies public successfully (Megginson and Weiss, 1991). More recently, Chemmanur and Paeglis (2005) have posited that IPO firms can also attain legitimacy through internal processes and, in particular, the recruitment of executives with impressive prior professional experience. Invariably, these approaches satisfy the criteria of an efficient signal by being both costly to reproduce (i.e. only high-quality issuers can afford them) and instantly discernible from IPO investors (for example, Rock, 1986 and Chemmanur, 1993). Also adhering to these principles, the first two empirical chapters of the present thesis intend to identify new avenues for instilling confidence in

market participants. In this vein, Chapter 3 investigates the effect that credit ratings can claim on reducing information asymmetries and Chapter 4 delves into the capital market reaction to the infusion of top management team with executives of prestigious educational backgrounds.

Unlike the above strategies, some others may take advantage of IPO investors' informational disadvantage to distort economic reality. This is attainable via the manipulation of reported earnings through the inflation of discretionary accruals. Commonly known as earnings management, this practice features extensively in the IPO literature (Teoh et al., 1998a:b; DuCharme et al., 2001; Roosenboom et al., 2003; DuCharme et al., 2004; Marquardt and Wiedman, 2004; Ball and Shivakumar, 2008; Lee and Masulis, 2011). Chapter 5 contributes to this research by focusing on a special niche of issuers, those with a traceable record of political connections. In this respect, the findings also enrich the interdisciplinary research studying the interdependencies between businesses and politics. The rest of this section delves deeper into the motivation and implementation of the present work.

1.2 Does it Pay to Invest in Higher Education? Evidence from U.S. IPOs

The first empirical chapter presents novel evidence on the relation of CEO academic and professional qualifications with short-run IPO performance. In the context of new equity issues, no study so far has identified the importance of the executives' educational background (i.e. academic qualifications); nevertheless, there is a well-established tendency for newly public listed firms to refer to prestigious affiliates, such as top-tier underwriters, well-established auditors and leading venture capitalists, to reduce the agency costs arising from information asymmetries (Beatty 1989; Carter, Dark and Singh 1998; Gompers and Learner 2004; Chemmanur and Paeglis 2005). This tendency implicitly associates prestige with quality and motivates us to investigate whether rigorous CEO education conveys a message of corporate excellence to outside market participants.

In particular we seek to examine whether CEOs' academic qualifications are perceived by potential investors as a signal of firm quality and if so whether it contributes to upraising distinguished CEOs in the IPO context. Our study further addresses the following interesting questions: Are the number of years spent in higher education as well

as the number of qualifications earned by CEOs associated with less money left on the table? Are there certain characteristics of university qualifications that affect the level of returns more than others? Does the quality of education (i.e. Ivy League; Nobel Prize winners; leading international universities) contribute to better IPO performance? Are doctoral degrees (i.e. Doctor of Philosophy, Juris Doctor and Medical Doctor) a criterion for CEO success?

To conduct our empirical approach we construct a sample of 1,131 US IPOs with prospectuses available on the Securities and Exchange Commission's (SEC) Electronic Data Gathering Analysis and Retrieval System (EDGAR) over the period 2000–2013. The Thompson Reuters Financial database was also employed for the collection of offer and closing prices of new issues as well as for all IPO-specific variables incorporated in our analysis. Data regarding the educational background and other CEO-specific characteristics were hand collected from the Boardex database, while the individual firm's' S-1 filings are also used as a supplementary source of information.

Methodologically, we provide new insights into the subject by showing that various CEO qualifications relate to underpricing contraction. Our study reports that graduate education reduces the level of initial returns but only for certain types of awards. After adjusting for the endogeneity and self-selection bias that may result from CEO–company matching, we document that the agency costs arising from information asymmetries are reduced by those degrees that market participants consider to be business-oriented. The same result holds true for professional qualifications that also aim to improve the entrepreneurial skills of individuals.

In particular the findings of this study suggest the following: 1) The existence of at least one university qualification and the number of degrees earned are associated with less underpricing. In line with the fundamentals of signaling theory, higher education serves as a proxy for ability and reduces uncertainty for outside investors. 2) At the master's level, the MBA and MA titles have the greatest impact on IPO performance. According to previous research (D'Aveni 1989; Norburn and Birley 1998; Hitt et al. 2001), the first of these awards is well regarded by market players for its business-focused curriculum and the second is linked to individuals who are more likely to enforce strategic changes in their organizations. 3) CEOs with qualifications from US institutions perform better than those with international education in terms of underpricing. Additionally,

executives who hold at least one graduate award from an Ivy League university significantly reduce the level of returns. The same conclusion holds for PhD graduates from the Nobel Elite group of colleges. 4) At the doctoral level of education, the Juris and Medical Doctor awards do reduce the initial returns. On the contrary, the PhD is always insignificantly related to IPO performance unless it is awarded by the Nobel Elite group.

Taken as a whole we contribute to the IPO literature in various ways. First, we provide new evidence of the association of the entire spectrum of graduate and professional qualifications with underpricing. Second, our results account for the endogenous nature of CEO qualifications. To our knowledge, the most relevant previous research on this topic has been conducted in the context of mutual funds and the various types of awards are considered as exogenously determined. Third, within the framework of signaling theory, this paper is the first to propose that university education can be perceived by outside investors as a signal of quality that associates the more educated Chief Executives with distinguished short-run performance.

1.3 Do multiple credit ratings facilitate the going public process?

The second empirical chapter constitutes an endeavor to explore the association of multiple credit rating acquisition with short-run IPO performance. Interestingly, the possession of credit ratings from various credit rating agencies (CRAs), as a means of the firm to communicate superior quality, remains a largely unexplored area in the IPO literature. This research investigates the impact of securing multiple credit ratings on the going public process. To this end we seek to address a series of research questions that are of particular interest to outside market players: Does the costly decision to acquire ratings influence the level of initial returns in the first place? Do credit ratings from a certain CRA affect IPO pricing more than those from others? Are acquisitions of multiple credit ratings valuable? Are there important differences among various combinations of multiple ratings on the reduction of underpricing? Is it worth it to maintain evaluations from all the three leading U.S. CRAs from an IPO perspective? Is the combined level of rating from multiple CRAs associated with less money left on the table? Finally, does a compound rating environment facilitate the book-building process via lowering the range of filing price revisions?

Our main conjecture is that the existence of independent evaluations from the trained experts of rating agencies within a reasonably short time period ahead of the floatation day; present an efficient way to communicate valuable information to outside market participants. As it is easily noticeable and also publicly accessible, a record of credit rating possession can in fact strengthen an entity's increased risk bearing aptitude. Therefore, potential investors of a new offer are more certain that the firm will encounter less market frictions and thus call for lower premia so as to procure its equity. On this basis, the IPO entity can commence operations as a public company by leaving only a modest amount of money on the table.

Motivated by the insufficient empirical evidence on this issue, we address the above questions and shed light to the role of multiple credit ratings as contributors to the success of new listed entities. In our analysis, we employ a comprehensive and large sample of U.S. initial offerings covering a period that spans from the 1st of January 1997 to the 31th of December 2014. Based on information retrieved from the Bloomberg database we manually inspect each individual corporation for evidence of acquisition of credit ratings up until its first trading day. This way we amass our special interest sample of firms that sought evaluations form various CRAs.

Methodologically, we are particularly careful to depict inferences not crippled by endogeneity. Given that firms' high ranked executives choose to attain credit ratings after deciding that potential gains from such an investment could exceed the cost required by CRAs, we are induced to recognize that self-selection is present in our empirical approach. In an IPO context, the benefits associated to the possession of ratings link to uncertainty mitigation which burdens the uninformed outsiders. Econometrically, this rationale implies that company specific characteristics impelling the decision to seek CRAs' evaluations also affect the level of initial returns. To effectively deal with feedback effects we instrument for the choice to obtain credit ratings with an array of rating determinants which are established in relevant literature and are specially modified to the IPO framework. Then we determine the selection as well as the outcome equations following a two-step process that constitutes both the Heckman and the generated instrumental variables (IV) method. The first methodology tackles self-selection bias arising from the corporation's will to create a credit rating record. The IV approach enhances the robustness of the chosen rating determinants included in the first stage regression by instrumenting with fitted values. We present both models next to the output

of the standard OLS estimations. Perpetually, all three procedures verify the soundness of our results.

This empirical approach evidently leads to findings that help us address the aforementioned research questions. In particular, our paper explains that credit rating existence per se from the world's leading CRAs forms an appropriate proxy of firm quality as evidenced by the distinguished short run performance of the rated IPOs. Invariably, ratings from each agency exhibit strong and adverse impact on the level of initial returns. Based on this inference, we take an extra step to assess whether the same pattern persists in the case of compound ratings. To this end, we run a range of regression specifications that scrutinize the effect of all possible combinations of rating agencies and we confirm that multi-rated companies contribute significantly to the mitigation of uncertainty in the going public process. This conclusion holds both for double and triple rating possession. Additionally, the grade level of the assigned ratings of each CRA, further contributes to a successful first trading day. Our study provides evidence in support of the notion that higher ratings are awarded to firms that investors perceive as less risky. At last, results reveal a fairly interesting phenomenon. Namely, the facilitating role of credit ratings is also present in the price discovering process during the book building period. Robust econometric output shows that CRAs' evaluations consistently filing price revisions downwards.

Assessing the fundamentals of rated IPOs, we discover that these issues are related to better quality as proxied by the extent of operational experience, market share, and the amount of proceeds raised. Additionally, alternative issuer specific variables such as the Tobin's Q ratio and investor valuations also verify the beneficial aspects of seeking CRA evaluations. Therefore, it becomes reasonable that rated companies engage in the costly investment of rating acquisition in an effort to handle in time market frictions and uncertainties that lay ahead.

1.4 Earnings Management of Politically Connected Issuers

The third and final empirical chapter of this doctoral thesis moves its focus away from the evaluation of short run IPO performance to earnings management (EM) schemes employed by newly listed corporations with political connections. Our

endeavor seeks to explain whether political money contributions (PMC), made by US issuers, incentivize executives to engage in income manipulating strategies in order to mislead prospective investors. Certainly, the actual level of reported profits comprises a fundamental element of firm performance that helps financiers to determine the value of the stock. For that reason, top-tier managers have a strong incentive to handle earnings so as to push short term share prices upwards. The impulse to use income favorably is even sturdier prior to an imminent new equity offer given that outside market participants would be inclined to buy new equity shares of highly profitable entities. Consequently, the IPO-company increases the prospects of a successful first trading day in which less money will be left on the table.

Several relevant studies, in accounting literature, investigate the patterns of EM around the IPO time and report evidence on systematic profit manipulation by firm insiders. In particular, it is well documented that the lack of financial intermediaries (prestigious investment banks, venture capitalists etc.) extra supports this type of accounting malpractice. Thus far, no previous attempt has been made to examine the role of political contributions towards this direction.

In general, the creation or enhancement of political ties is regarded as value adding strategy as existing empirical proof verifies that connected business more often than not capitalize gains from their political affiliations that surpass the costs they incurred to create these ties. For instance listed companies with political ties enjoy lenient credit terms, higher market shares and are less likely to be disciplined from regulatory authorities (Faccio 2006, Boubakri et al. 2008, Chen et al. 2010, Cooper et al. 2010 and Chaney et al. 2011). Following this line of reasoning we test whether PMC-IPOs can also extract rents from their investments in politics.

To sufficiently address this conjecture we gather a comprehensive sample of US new equity offerings over the period January 1, 1998 to December 31, 2014. By hand, we scrutinize each individual firm for a record of PMC activity and this leads us to our special sample of interest.

For an inclusive investigation of earnings treatment practices we rely on two EM approaches: 1) accrual based EM that takes in misuse of professional judgment regarding accrual recognition and 2) real EM that entails changing the time or structure of real activities.

Econometrically, we put special emphasis on the derivation of results that are less affected by endogenous selection. Considering that firms' decision to direct

corporate money to political coffers rests entirely upon top-tier management; it is plausible to assume that particular company specific attributes impacting the PMC choice also influence EM schemes. To adjust for feedback effects we instrument for connections through a set of customary determinants of PMC whereas we also bring in original ones, particularly, customized to the IPO framework. The outcome and selection equations are estimated in a two stage process following instrumental variables (IV) and Heckman-treatment effects models. The later method tackles self-selection bias arising from the fact that the decision to establish a PMC record is inherently determined by top managers. The first method instruments via fitted values and strengthens the validity of our assortment of PMC contributors. To further test the robustness of our empirical findings we simultaneously estimate the outcome and selection specifications by means of maximum likelihood (MLE). Consistently, results hold across all econometric approaches.

This empirical approach renders support to our initial conjecture that newly listed PMC firms are more prone to handle accruals as well as real operating activities in order to inflate reported income. Also, the actual level of both PAC and lobbying disbursements positively relates to the extent of EM undertaken by prospective issuers. This suggests that corporations donating money to politics capitalize benefits from their connections as they become opaque in their earnings reporting practices. The opposite is true for the non-connected sample companies.

Our evidence has important ramifications for practitioners as well. The results we offer are primarily useful for controllers and supervisory bodies that are interested to appraise the meticulousness of reporting practices by PMC-issuers. For potential investors our empirical output can be a signal of caution that connections lessen top-management's hesitation to manipulate earnings so as to facilitate a successful IPO.

Chapter 2 - Literature review

2.1 The problem of IPO underpricing

The indubitable stimulus to academic research on Initial Public Offerings (IPOs) has been the empirical observation that IPOs systematically realize abnormal positive returns on the first day of trade. Stoll and Curley (1970) in their assessment of the role of firm size on the cost of equity capital, have been the first to document a positive skewness in the distribution of returns for IPO shares. Utilizing a large sample of equity issuers drawn from companies going public over the period 1950-1960, the authors failed to corroborate their initial conjecture that larger companies enjoy a preferential access to capital markets. However, the IPO underpricing (i.e. the positive gap between IPO offer price and the first aftermarket close) proved surprisingly, robust.

Ibbotson (1975), delving further into this conundrum, utilizes a time period identical to Stoll and Curley (1970) and subjects the sample to a battery of robustness checks. Invariably, the effect remains strong and fixated at an average first-day return of about 11.4%. Subsequently, the researcher allows for the initial sentiment to settle down and compares returns on IPO shares from the second to the sixth month after the initial floatation day. Indeed, these alternate time horizons yield no statistically significant differences compared to the market portfolio. Thus, Ibbotson admits that the effect is inherent to the going-public process. He also admits to have provided sufficient evidence for its existence while inviting new research to shed light on the causes for which he declared unable to attach a causal relationship.

A first attempt on the causation can be found in the manuscript of Logue (1973). Logue frames an IPO sale as a clash of power between the issuing firm and its lead underwriter. Because underwriters refrain from pricing their services on a competitive basis, the market model can be framed in terms of a monopsony. Also drawing from the resource-dependency theory, Logue suggests a number of features that could enhance an issuer's bargaining power in pricing negotiations. For example, large establishments which already experience profitability in the pre-IPO regime are in the position to prolong the procedure until an acceptable valuation outcome arises. However, sustaining operations through organic growth is typically unattainable to prospective issuer. Overall,

this imbalance in power favors the investment banker who is capable of dictating the terms of the IPO sale, causing the firm to forego a large amount of funds at IPO and incur a substantial opportunity cost.

2.2. IPO underpricing and information asymmetries

In contrast, Rock (1985) identifies a different culprit for the observed pricing anomaly. Focal to his framework is the interaction between issuer and IPO investors rather than that of issuer and underwriting agent. Rock also differentiates among investors based on the degree of information possessing pertinent to issuer quality and overall standing. Given that IPOs are oversubscribed, investors with proprietary insight have an incentive to place bids only for above average companies. Then, it follows that uninformed investors can only attain placements for offerings that are unappealing to informed investors. As a consequence, an incentive should be given to ensure adequate subscription for all offerings. Investment bankers as the market makers in this procedure conveniently create this type of incentive by allowing for a discount in the price of the new securities. In this respect, underpricing comprises an implicit form of insurance for both the issuer and underwriter against the risk of undersubscription even though the cost burdens exclusively the former party.

Benveniste and Spindt (1989) theoretically equate the IPO event to a conventional auction sale. In this view, the commonalities abound with the exception of two notable differences: i) investors' bids are not binding offers for purchase and ii) the price of the asset on sale is not set in advance. In fact, the offer price is to emerge based on prospective buyers' feedback and proprietary insight. In this case, however, investors lack a plausible incentive to engage in truthful revelations. Accordingly, the underwriter is believed to allow for a profit-making opportunity by increasing the IPO price only partially to good news. From an angle complementary to Rock (1985), therefore, underpricing is presented as a form of deferred compensation towards cooperative IPO investors. At the same time, the authors note that this compensation may also result by means of preferential allocations to the present or other IPO sales.

Henley (1993) seek empirical evidence in support of the theoretical construct of Benveniste and Spindt (1989) through the examination of a sample of US IPOs over the

period 1983-1987. The insight from the bookbuilding process of these firms is compelling. In particular, the authors compare the filing price range for these equities vis-à-vis the final IPO offer price. Remarkably, offerings that were priced higher than what it was initially predicted experienced an average IPO return of about 21%. Among them, the paradigm of the Microsoft IPO is indicative. The company commenced the price-discovery process with a price range between $ 16 and 19. On the actual floatation day the shares were finally offered for $ 21 and closed trading at $ 27.75 accounting for an underpricing of 32%. Notably, the reverse relationship (i.e. an offer price smaller than the lower limit of the filing price range) fails to generate a definite pattern with first-day returns. The effect also disappears when price revisions are used as predictors for long-term IPO returns (two-year returns and other time windows tried by the author in the robustness tests). Conclusively, while Henley may not rule out alternative explanations, he provides substantial empirical validation for the use of underpricing as a means of compensation for good news revelations.

Notwithstanding the relevant costs, mainly in the form of underpricing, Benveniste and Wilhelm (1990) contend that the IPO market is better off in lieu of regulatory interference. Their empirical evidence comes from the U.S. as well as other capital markets. The NASD Fairpractice Rules imposed by the SEC call for valuing the offered securities in a uniform procedure for as long as the price discovery process lasts; a procedure that bears a lot of the characteristics of a call option. In Singapore and the U.K, there is a requirement for the 'evenhanded' disposal in cases of oversubscription. Especially, Singapore has to abide by both requirements. The result of regulating the IPO activity is common in all of these settings by means of increased underpricing. That is, incremental underpricing which is absent in less regulated capital markets and can be reasonably attributed to the regulations after controlling for a number of country-specific factors. Conclusively, the authors recommend that imperfect as it is, the IPO market can still allocate capital considerably more efficiently once the principal IPO participants are left unconstrained to perform their economic role.

Lowry and Schwert (2004) also investigate whether the process of IPO pricing is an efficient one. Towards this, the authors test if the assigned valuation reflects all publicly available information during the bookbuilding period. Thus, variables of firm and offering – specific characteristics are regressed on the IPO price at the inception of the price discovery process and also on the final IPO offer price. Presumably, if the

process is fully efficient, these factors should claim no incremental explanatory power. However, they are found to collectively account for a 3% in the observed variation. Further regressions of these factors upon IPO returns produce an effect of approximately the same magnitude. Taken together, the evidence suggests that underwriters exercise some degree of selectivity on the information they incorporate into equity valuation. At the same time, the effect comes out economically insignificant and, therefore, any speculative trading based on this pricing anomaly would fail to generate abnormal returns. Therefore, Lowry and Schwert draw the conclusion that the IPO market is "almost efficient".

2.3 Signaling theories of IPO underpricing

Also assuming asymmetry in information between the issuing firm's management and the broad investor base, a growing number of studies assess the IPO firms' effort to disseminate quality and instill confidence in prospective buyers. An efficient signal should generally satisfy two fundamental criteria: i) it has to be costly to imitate so that it is attainable only by prosperous organizations and ii) it should manifest itself in an unambiguous, easy to comprehend manner. Given the ample room for interpretations, the mechanisms explored are diverse, creative and frequently controversial. Regardless, a common theme emerges in their framing of IPO underpricing as the reflection of an issuer's ex ante uncertainty.

Beatty (1989) proposes as a potent signaling mechanism the employment of reputable underwriters. Being the agents certifying the validity of the regulatory filings produced by management, auditors can severely hurt their own brand equity by tolerating inaccurate data or reporting driven by unwarranted assumptions. Therefore, IPO investors can reasonably expect from the most recognizable CPA firms (i.e. Big-8 firms) to self-select themselves into the facilitation of a quality clientele only. This way, the auditor's reputation can plausibly lead a portion of an issuer's ex ante uncertainty to subside, so that the latter one is set to realize less underpricing at IPO. The author provides robust evidence in support of this conjecture using two alternative reputation proxies: i) Big-8 standing and ii) auditing fees with the assumption being that better auditors charge a premium for their service. Invariably, and after controlling for a number of confounding factors, these variables confirm the inverse association with first-day returns.

Megginson and Weiss (1991) view an additional route for issuers to claim prestige spillovers. This comprises inviting successful VC (venture capital) firms to share ownership in the company. Unlike reputable auditors, VC affiliations can invite controversy. The reason is the short-term investment horizon that many VC firms share. As per the grandstanding theory of VCs, many of them will pressure the issuer's management for a premature IPO in order to release funds for their investment pipeline inclusive of next IPO targets. However, a VC with a proven history of taking companies public successfully can comprise a valuable partner. As such it can frequently offer more than the functional equivalent of capital provided in terms of industry expertise and focused advice to the issuer's management. Furthermore, the appointment of VC-affiliated executives in the prospective issuer's board of directors imposes controls and monitoring on the company at a strategically early stage. Indeed, the comparative study of 320 VC-backed IPOs against a sample of carefully matched IPOs has shown both less underpricing and superior long-term market performance for the former group. Megginson and Weiss also evidence a high correlation between the VC presence and the likelihood of having the offering facilitated by a top-notch underwriter. Conclusively, the researches value positively the VC involvement as a means for successfully referring a new issuer to the marketplace.

Carter et al. (1998) test the strength of the foremost financial intermediary participating in an IPO, i.e. the underwriter, on predicting first-day as well as long-term (3-year) returns. Because typically IPOs are underwritten by an investment banking consortium, the researchers develop a comprehensive index for capturing and assessing the relative influence of all members involved. Specifically, the investment banks listed on tombstone announcements are treated as actors' names on Hollywood billboards whereby the order of appearance reveals the importance of their role. This framing ensures that each underwriter is weighted in a way commensurate to his contribution. In this respect, the index also appears to have a decisive advantage over the previous construct of underwriters' reputation by Megginson and Weiss (1991). The cross-sectional regressions of the index on IPO returns confirm the better IPO performance that the authors hypothesized; there is less money left on the table during the first-day of trade and a higher long-run performance compared to offerings of less reputable agents. Lastly, the authors consider the underwriting commissions. Even though, they are significantly

higher for tier-1 investment banks, the performance of the IPO shares in the aftermarket period guarantees the recouping of the initial investment.

Certo (2003) draws extensively from the realms of sociology and literature to argue that investors' cognitive framing is driven by anchoring. In this respect, social stereotypes constitute one organization more appealing over another one when certain conditions are met. IPO investors as potential owners select the agents to manage their savings based on a set of commonly acceptable proxies for prestige. As a consequence, a top academic background, a professional record of success, powerful social acquaintances and peer recognition comprise a non-exhaustive list of director characteristics which collectively can have a profound impact on combating the market newness liability. Although the author recognizes the difficulty in quantifying and modeling soft qualities like these, Certo asserts that an effective signaling strategy can rely on the staffing of top management teams with individuals scoring highly on these dimensions. Understandably, the latter ones would not risk to impair their reputational capital by affiliating with companies of dubious quality.

Chemmanur and Paeglis (2005) put Certo's conceptual framework under empirical investigation using three distinct proxies for top-echelon prestige: i) the quality of academic studies and prior industry experience of the board of directors, ii) directors' tenure in the firm and iii) CEO power measured as the compensation paid to CEO in excess of that paid to other directors. Overall, the cross-section of these dimensions on a series of issues of interest during the IPO event provides robust evidence of their value-relevance. Specifically, in cases where reputable directors spearheaded the IPO endeavor, their firms were able to realize smaller underpricing, and below-average underwriting fees. Moreover, the subscription interest from the institutional clients of the underwriter was considerably higher. Non-coincidentally, the chance that these firms were taken public by a top-ranked investment banker was also higher. The analysis extends deeply into the aftermarket period and shows even more benefits over the long-run. In particular, the common problem of IPO underperformance subsequent to the euphoria of the first few trading days is practically nonexistent as evidenced by average or better market and accounting measures of return. Importantly, the continuity of good performance differentiates this signaling mechanism from others showing that a reputable board primarily comprises a long-term investment.

Ann and Chan (2008) contribute to literature a novel mechanism for mitigating issuers' ex ante uncertainty: the attainment of a rating on the firm's debt prior to the IPO event. The authors focus on a relatively small fraction of issuers which advance to an IPO rated. Analyzing the period 1986-2004, 161 out of a total 5,141 IPOs have been found to disclose this extra piece of information. Parenthetically, only ratings from Standard & Poor's are used which comprises one of the limitations in this study. Even so, the results show significantly lower underpricing for the rated sample. Subsequently, Ann and Chan delve deeper into the causes by asking whether the simple existence of a credit rating is accountable for the effect or whether incremental explanatory power resides in the observed rating level. Reiterating the baseline analysis in the sample of rated IPOs only, the authors fail to obtain statistically significant relationships. Taken together, these findings suggest that a credit rating, be it high or low, suffices to alleviate a considerable portion of the uncertainty in valuation. Drawing additional evidence from the aftermarket volatility, the authors report a considerably smoother trading pattern for rated securities. Of course, caution is exercised for the likelihood that issuers of specific characteristics (for example, a large size or longer operational experience) self-select themselves into the rated sample. In this respect, the effect survives the Heckman and instrumental variables method even though the inverse Mills ratio from the former method assumes a highly significant coefficient.

Notably, Ann and Chan have not been the first to investigate the interaction of credit ratings with the offering of primary securities. Liu and Malatesta (2006) studied extensively the cross-section of seasoned equity offerings (SEO) with credit rating levels. Because the firms were traced at a considerably later point in time than their IPO, the sample is considerably larger comprising 3,243 U.S. companies listed on the major American exchanges. Assuming asymmetrical information among market participants, the authors first tested the existence of a credit rating on SEO underpricing and abnormal share returns upon the SEO announcement. In accord with the hypothesized directions, credit ratings both limit underpricing and increase market performance within the respective time window. In addition, the authors provide evidence that subsequent to SEOs, firms on average improve their credit ratings levels. Conceivably, the proceeds raised constitute the company's debt less risky as also predicted by the wealth-transfer hypothesis.

2.4. IPO underpricing theories assuming symmetrical information

Loughran and Ritter (2002) through an extensive time series analysis of IPO returns over the period 1980 to 2003, while still corroborating the existence of underpricing, they evidence considerable fluctuations in the observed magnitude. Their findings are summarized in 4 time periods: i) 1980-1989 with a mean IPO-day return of 7%, ii) 1990-1998 with a mean return more than double from the previous period (15%) iii) the overheated market of 1999-2000 with the record-high underpricing of 65% and iv) 2001-2003 when IPO returns settle down again to less extreme values with a mean of 12%. Commenting on the upward pattern, the authors express the certainty that IPO retunrs will always exceed the modest levels which were observed in the 80's. Also lending empirical support to the theoretical model of Chemmanur (1993), the authors uphold that gradually over time issuers have become more appreciative of the non-pricing dimensions of an IPO. In particular, a large first-day return is conducive to attracting analyst coverage, a benefit that can result in increased trading for the firms' financial instruments and, thus, recoup, in time, the initial loss.

Lowry and Shu (2002) propose IPO pricing as a form of litigation deterrence. As is commonly the case, a number of IPOs are legally prosecuted by investors considering that the firm performance in the public domain falls short of the expectations created by management disclosures during the pre-IPO period. The authors estimate the cost of the pertinent lawsuits at an average of 11% of gross proceeds, whereas in some cases it reached 50%. Over the examined time frame, 1988-1995, 6% of total IPOs were sued solely because of pricing as their initial valuations failed to sustain their levels in the aftermarket period. Notably, the cost of these lawsuits can also be nonmonetary as is the impairment of the issuer's reputation as well as the reputation of the involved intermediaries (i.e. underwriter, auditor and legal counselors). Conceivably, a lower IPO offer price could at least partially insulate a firm from the confluence of negative implications. In this respect, the authors investigate the possibility that issuers invite a certain degree of underpricing as legal insurance. Overall, the findings are in accord with

their conjecture and hold even after the endogenous setting is accounted for via the method of instrumental variables.

Loughran and Ritter (2004) draw from prospect theory to offer a behavioral interpretation of IPO underpricing. Observing that most heavily underpriced IPOs come from issuers who end up with an offer price higher than the upper limit of the filing price range, the authors try to analyze the main sentiment prevailing among management members. The latter ones receive the good news of the higher offer price almost simultaneously with the bad news of the money that was left on the table. Then, also based on evidence from psychology, the good news act as a sweetener for the foregone wealth making the management more complaisant. In addition, the fact that underpricing is an opportunity cost rather than an actual cash outflow often mitigates pertinent complaints. A second behavioral interpretation offered frames the excess first-day return as a further compensation paid to underwriters. The latter ones can benefit from a discount in the IPO offer price by rewarding their preferred clients with an opportunity for a riskless profit. By not raising strong opposition to this discount, the issuer's management hopes to claim preferential allocations in future offerings on a quid pro quos basis.

Chahine and Goergen (2011) investigate the possibility that the structure of executive compensation determines some of the IPO terms. Specifically, the researchers pay special attention to the fact that a large sample of issuers grant managers options with exercise prices linked to the IPO offer price, while frequently the two prices are exactly equal. Therefore, this remuneration scheme generates a direct incentive for executives to agree to an early IPO; conceivably, the more extensive the underpricing on the company's equities, the larger the payoff is expected to be. As the authors estimate, during the period 1997-2004, about a fourth of firms going public granted their CEOs this type of options. Based on their firms' IPO returns, these options resulted in an average gain of $ 693,901. Given the substantial upside potential, Chahine and Goergen suspect that especially when VC firms are present, IPO options can act as a bribe to fast-forward towards their exit via an IPO. The empirical findings in their big picture do not necessarily show more underpricing than firms relying on less variable compensation types. However, when the possibility that the IPO employs venture capital is accounted for, the difference in the mean underpricing of the two samples is significant. Subsequent testing reveals that corporate governance can also be a factor. Notably, powerful CEOs and entrenched boards appear strategically poised to benefit the most and, on average, they do. Therefore,

although the authors do not object options granting in light of an imminent IPO, they call for strong monitoring mechanisms and internal processes to hamper opportunistic behaviors.

2.5 Earnings Management of IPO firms

Teoh et al. (1998a) motivated by the long-run underperformance that IPO shares typically suffer from, seek the causes in issuers' financial reporting. Conceivably, the management in order to secure adequate subscription for the offering has an incentive to ameliorate its performance. In the documents of regulatory disclosure, such as the IPO prospectus (S-1) form, the infusion of an optimism bias is possible through the manipulation of discretionary accruals. The latter ones comprise one of the two components of accounting net income, with the other one being cash generated from operating activities, and are intended to smoothen out reported earnings. Moreover, accruals can be divided further into current (e.g. sales/expenses recognition and provision for bad debts) and long-term (e.g. depreciation choices and deferred taxation) based on the number of reporting periods that can claim an effect upon. Because IPO firms lack a record of historical accounting information, the authors mainly focus on current (IPO-year) accruals. They also split the sample in quartiles based on the observed intensity of earnings management compared to non-IPO companies from the same industry. The findings show that issuers belonging to the quartile associated with the highest discretion in accruals typically underperform the rest IPOs by 20% over a three-year period. In addition, they are also 20% less likely to issue SEOs. Taken together, the evidence is in line with the efficient market hypothesis in the sense that IPO investors are capable of detecting the accounting abuses and share prices are reverting to a level that is attentive to the firm's economic reality.

Teoh et al. (1998b) employ additional benchmarks of discretionary accruals and corroborate the inverse relationship with IPO long-term returns. Complementing the market performance evidence with accounting measures, they offer a holistic overview of the implications of the earnings management behavior. In particular, return on sales follows the downward pattern of share performance; IPO firms from the quartile with the most intensive earnings management experience a return on sales which is on average 16.50% lower than the realized one at the IPO year. Furthermore, in an attempt to

disentangle among the various accrual choices the items which become most frequently manipulated, the researches prioritize depreciation and uncollectible revenue recognition.

DuCharme et al. (2001) term the underperformance of earning managing issuers as the 'disappointment hypothesis' and subject it to new empirical investigation. Drawing evidence from 171 U.S. IPOs over the 1982-1987 period, the authors validate the prior findings. In parallel, they mark a second contribution in developing and investigating an additional conjecture, the 'value-relevance hypothesis'. Accordingly, accruals manipulation are assumed to have a positive effect on initial value, irrespectively of its transient nature. The empirical model regresses on the latter variable (estimated as the offer price times total shares outstanding after the IPO) three district earnings components: i) cash flow from operations ii) unmanaged or normal accruals and iii) managed accruals. Notably, while all elements come out as significant predictors of initial value, the resulting coefficient is largest for managed accruals. Taken together, the evidence divulges a roller-coaster effect of earnings management upon firm value which can opportunistically facilitate managerial objectives.

Lee and Masulis (2011) investigate for a differential effect on earnings management by IPO firms based on two major participants in the IPO sale: lead underwriter and venture capital. With regard to the latter variable, a venture capital affiliation appears to be of little relevance. Yet, when the authors control for the reputation of the venture capital firm, earnings management is significantly less probable. The same holds for the underwriter's reputation: the higher the ranking, the lesser the extent of earnings management. Interestingly, the effect is the highest once both a reputable underwriter as well a reputable venture capital firm are involved. These inferences survive a battery of endogeneity tests (inclusive of the nonparametric framework of propensity score matching) to account for confounding factors that may influence the underwriter's choice and the decision to resort to venture capital financing. Conclusively, a reputable agent is generally unwilling to jeopardize his reputational capital for the upward potential that an accruals manipulation strategy can offer over the short-run. Even though, this can be substantial: firms of aggressive earnings management have significantly more heavily subscribed IPOs and attain higher valuations.

2.6 Research on Political Connections

The literature on political connections has largely sprung out of the empirical observation that a number of corporate organizations transcend their economic role to channel capital towards politicians. Notably, as estimated in Faccio (2006) links to politics are evident in 541 firms worldwide which collectively account for the 8% of global market capitalization. The overlap of business and political activity has motivated finance scholars to delve into both the incentives and implications. Ultimately, the common research question comes down to whether sponsoring politicians is a form of perquisite consumption or if it can actually obtain investment characteristics.

In the seminal work of Faccio (2006) evidence is drawn from a sample of 20,000 quoted firms comprising 47 different countries including the U.S. The cross-country comparison reveals that the value-relevance of political connections varies considerably with each country's governance and economic characteristics. In particular, connections prove most valuable in light of corrupted regimes as well as those imposing severe regulatory obstacles upon capital flows. Interestingly, there is a positive association with the degree of transparency in a political system which also explains the strong results obtained for the U.S. Investigating the share price reaction to a variety of events that are susceptible to confer 'connectedness', Faccio offers important insight on the mechanics of the relationship. Specifically, she contrasts two seemingly opposite settings: i) politicians, incumbent or veteran, that join corporate board of directors and ii) executives who enter politics. The first avenue of establishing connections triggers an insignificant share price reaction. The second one results in a robustly positive effect which is maximized once the former corporate official attains the prime minister's position. Collectively, findings show that both politicians and firms seek economic rents in their between interactions. The failure to generate a statistically significant relationship when politicians join corporate boards fuels such concerns which cancel out any probable benefits that they can bring to the firm. In the reverse case, however, the potential for positive externalities prevails, on balance, and is accordingly hailed by market investors.

Another important international study on the symbiotic relationship of business entities and national governments is that of Boubakri et al. (2008). With a more narrow focus, the researchers trace the privatization process of 245 state-owned companies across 41 countries (14 of which developed and 27 underdeveloped). They divide further the

sample based on whether politicians of past or present tenure can be found within the top management team and, thus, a sample of special interest emerges comprising 87 politically connected organizations. On average, these firms are more likely to operate within heavy regulatory frameworks, have a more levered capital structure and are headquartered in short distance from capital cities or other local administration. In comparison to non-connected peers, politicians' firms lag in a number of dimensions. For example, they are associated with difficulties in market penetration and, therefore, with a limited growth potential. An additional shortcoming pertains to the low return on sales ratios evidencing further problems in converting even this limited turnover to a commensurately satisfactory profit. Notwithstanding these red flags, the authors show the politicians to enjoy remarkable job security in firms that the government maintains a large ownership even after the transition to the private domain. In contrast, foreign investors are inversely associated with the probability that the politicians remain in their corporate duties in the wake of poor performance.

Chaney et al. (2011) extend the list of politically connected firms' shortcomings to include the accounting quality. The authors explore two different possibilities in this respect. On the one hand, the increased attention brought to the firm because of its proximity to politics may force management to exert greater effort towards its regulatory reporting requirements. On the other, the firm's political capital may comprise a better predictor for future prospects than the accounting figures. In this case, the demand for accuracy and extensive disclosure should diminish causing a discernible effect on firms' reporting and broader accounting output. The evidence from 19 countries strongly aligns with the latter perspective. In addition, connected firms are not penalized for this deficiency in terms of a deteriorating market or accounting performance. The authors surmise that the succinct reporting may strategically represent an effort to deter further scrutiny on the nature of the firm's political connections in fear of scaring away existing protégés.

Correia (2012) takes this research one step further by exploring the authorities' leniency in cases of malpractices and noncompliance by firms with links to politics. Drawing evidence from the US, the researcher analyzes for a likely preferential treatment for firms which are actively involved in lobbying campaigns. The sample includes listed companies which fall under the supervision of the Securities Exchange Commission (SEC). SEC as the government watchdog for the efficient functioning of capital markets

oversees the regulatory compliance by member companies and undertakes corrective actions in cases of firms failing to abide by the required procedures. Investigating the SEC's archive for enforcement actions against violators, Correia reveals a pattern of significantly milder penalties, in terms of monetary severity, for companies i) lobbying the SEC ii) providing campaign financing to politicians sitting committees relevant to SEC matters and iii) employing same lobbying firms as the SEC. It is noteworthy that firms channeling the largest amounts towards lobbying appear as the most frequent violators of SEC practices, proving the rent-seeking orientation of their political strategies.

Yu and Yu (2010) are the first to draw the line between political donations and corporate fraud. Studying all major U.S. corporate scandals over the period 1998-2004, the authors complement the evidence of Correia in an emphatic way. In particular, fraudulent firms which exhibit any type of lobbying activity have an increased probability to escape authorities' attention. Politically connected firms that are held accountable for their actions also experience different detection times; on average 4 months slower than other violators. This time lag proves valuable to corporate insiders in order to reduce their personal exposure by aggressively selling equity shares in the company. As a primary cause for this insulation from prosecution, the authors point to the fact that over a half of U.S. Congressmen embark on corporate careers upon the termination of tenure in Congress.

Cooper et al (2010) differentiate among the observed political connections based on politicians' idiosyncratic characteristics and qualities. Their evidence comes from a time-series analysis of a large number of politically connected U.S. corporations over the period 1979-2004. To investigate the conjecture that support to certain candidates is associated with incremental value for the company, the authors develop comprehensive indexes of candidate characteristics based on their relative strength, power and ability. Accordingly, each of these categories represents a bundle of distinct features such as career progress in Congress, length of tenure, committee assignments, state of origin, partisan identity and Congress chamber affiliation. Once adjusted for the time that the relationship with the sponsor firm spans, assuming an uninterrupted pattern of contributions, these indexes are regressed on firms' market performance. The results not only prove authors' hypothesis that reputable and long-tenured politicians generate a stronger effect than new challengers, but also reveal interesting insight based on

candidates' party and electoral race. Specifically, aligning with Democratic politicians or those running for the U.S. House of Representatives, as opposed to the Senate, systematically leads to higher abnormal returns. The effect is similarly strong for support towards politicians representing the firm's state of headquarters.

Chen et al (2010) complement the U.S. findings with evidence from China. The study of 276 connected organizations over the period 1993-2008 reveals that connections arise in geographic segments which remain subject to intense government regulation. Also the authors note that since the country's transition from a centrally-planned to a market economy has not transpired in a simultaneous, uniform procedure, regions where local economic activity resembles more to the old regime exhibit a significantly higher probability of hosting politically connected companies. Lending support to the rent-extracting view, therefore, connections prevail where they can be proven most valuable. In addition, connected firms are characterized by highly concentrated ownership structures with the owners commonly presiding the board of directors or appointing family members to other key executive positions. Clearly, in this case, while benefits from the proximity to politics can still accrue to the whole organization, owners strategically pose themselves to capture a bigger portion of the surplus value created.

Chapter 3 - Does it Pay to Invest in Higher Education? Evidence from U.S. IPOs

3.1 Introduction

When Google went public on August 18, 2004, a great deal of publicity was generated by the world's conventional and financial media, which discussed a successful IPO that managed to raise 1.916 billion dollars with a relatively low level of underpricing. The intense media exposure placed the Managing Director and future Chief Executive Officer (henceforth CEO) Dr Eric Emerson Schmidt, the individual in charge of the total management of Google and responsible for strategic decision making, at the center of the international headlines. Dr Emerson Schmidt, a software engineer, impressed the general public with his exceptional educational attainments. Holding a bachelor's degree in engineering from Princeton University and a master's and PhD from the University of California at Berkeley, he is one of the most remarkably educated executives. His impressive profile, drawn by rigorous education at some of the world's most prestigious universities, made people believe that this is one of the key elements of success. Equally spectacular in terms of media coverage was Facebook's IPO on May 18, 2012, an initial public offering that was almost fairly priced with initial returns at around 0.6%. The creative and entrepreneurial spirit of the 'self-made' Mark Zuckerberg fueled Facebook with energy to succeed. Mr Zuckerberg's case is entirely different from that of Google's CEO, as he dropped out of Harvard College at 20 to found what appears today to be one of the most fashionable and successful firms around the world (i.e. more than 1.2 billion users, total assets of $15.10 billion and revenue of $5.1 billion), which on the day of the IPO managed to raise $16 billion.

This research is related to the existing literature that investigates the link between education and firm performance. Human capital theorists (Becker 1993; Spiegel 1994; Spender and Grant 1996; Aliaga 2001; Hitt et al. 2001; Hendricks 2002) suggest that individuals and society derive economic benefits from investments in people. In the light of this framework, several studies (D'Aveni 1989; Norburn and Birley 1998; Hitt et al. 2001) focus on the importance of the articulable type of knowledge. This can be acquired through the education process and is associated with individuals who possess the highest

potential to succeed in their assigned jobs since education is the best proxy for skills and ability. As a result, high-quality employees seek to distinguish themselves via accolades from prestigious institutions (Spencer 2002). Accordingly, the relevant management literature (Dewar and Dutton 1986; Norburn and Birley 1988; Wiersema and Bantel 1992) suggests that executives with engineering and liberal arts qualifications are more likely to embrace corporate strategic changes and enforce innovative courses of action. Empirical evidence in the field of finance (Golec 1996; Chevalier and Ellison 1999; Gottesman and Morey 2006) exclusively focuses on mutual funds and reaches the consensus that graduate education at prestigious colleges is associated with improved fund performance. In the corporate finance context, and more specifically in IPOs, no study so far has identified the importance of the executives' educational background (i.e. academic qualifications); nevertheless, there is a well-established tendency for newly public listed firms to refer to prestigious affiliates, such as top-tier underwriters, well-established auditors and leading venture capitalists, to reduce the agency costs arising from information asymmetries (Beatty 1989; Carter, Dark and Singh 1998; Gompers and Learner 2004; Chemmanur and Paeglis 2005). This tendency implicitly associates prestige with quality and motivates us to investigate whether this association holds true for the quality of CEOs' educational attainments.

Previously, we have seen two successful CEOs with fundamentally different educational backgrounds transform their firms from private to public, achieving a low level of market discount. This makes us wonder whether CEOs' academic qualifications are perceived by market participants as a signal of firm quality and if so whether it contributes to upraising distinguished CEOs in the IPO context. Our study further addresses the following interesting questions: Are the number of years spent in higher education as well as the number of qualifications earned by CEOs associated with less money left on the table? Are there certain characteristics of university qualifications that affect the level of returns more than others? Does the quality of education (i.e. Ivy league; Nobel Prize winners; leading international universities) contribute to better IPO performance? Are doctoral degrees (i.e. Doctor of Philosophy, Juris Doctor and Medical Doctor) a criterion for CEO success?

Inspired by the above reflections on the subject, we seek to answer these questions and establish new evidence on the impact of higher education on firm performance by investigating the relationship between CEO academic achievements and the level of

underpricing incurred by the firm on the first day of trading. Our analysis is based on a sample of 1,131 IPOs that floated on the US stock exchanges over the period 2000–2013. The time period is sufficiently large to incorporate the effects before and after the subprime mortgage crisis that hit the US economy during the first decade of the century. Compared with previous studies, we make two important research deviations in our approach. First, we examine the public listings of all types of companies to account for inter-industry performance effects instead of focusing on a particular sector like previous studies (Dewar and Dutton 1986; Wiersema and Bantel 1992; Hitt et al. 2002). Second, we examine the effect of all types of university qualifications on performance instead of targeting CEOs with a specific area of expertise (Norburn and Birley 1998; Tyler and Steensma 1998; Barker and Mueller 2002). In this context, we argue that higher levels of university education coupled with the rigorous mode of study provided by prestigious institutions should equip executives with the required skills to boost their firm's short-run IPO performance.

The results provide strong support for our suppositions. In particular, investigating the overall effect of higher education on the money left on the table, we find that the existence of at least one university degree, as well as the number of acquired qualifications, is associated with a lower level of underpricing. The findings are statistically significant and aligned with the basic premise of human capital theory, which regards education as human resource investment that contributes to firm value maximization. The economic importance of our results is also eminent. We estimate that the acquisition of an additional university award leads to a 2.43% reduction in initial returns. Consequently, outside investors are justified in regarding CEO academic attainment as a signal of IPO performance.

We further find that among the various types of graduate titles the most robust inferences can be made for the Master of Arts, MBA and the Juris Doctor award as their relation with smaller market premia is strong. Our evidence regarding the Master of Arts is supported by the management literature (Norburn and Birley 1988; Wiersema and Bantel 1992), which links graduates from liberal arts colleges to increased levels of innovation and strategic change, Chevalier and Ellison (1999) associate distinguished mutual fund performance with an MBA degree; with regard to the Juris Doctor title, no previous study is available. After adjusting for university-specific characteristics, we report that only for the PhD award does the Nobel Elite group of colleges perform better

than the rest of the sample in the IPO context. Additionally, CEOs with any type of professional qualifications are positively linked to superior performance.

In our analysis, we also take into account the problem of endogeneity. Specifically, in cases in which the decision of a firm to hire a CEO with certain qualifications is a matter of choice and not randomly determined, OLS regressions could produce unreliable estimations. As we report in our preliminary discussion, there is a tendency of firms that are smaller in terms of total assets to hire Chief Executives with doctorate qualifications. On the contrary, larger companies prefer individuals with master degrees at the top of their corporate hierarchy. Thus, to cope with the issue of possible endogenous selection in our regression specifications, we employ the treatment effect method of estimation. Additionally, Heckman's two-stage model is used to verify the absence of self-selection bias. Our results continue to hold even after controlling for different types of industry classifications and alternative measures of underpricing.

This study contributes to the IPO literature in various ways. First, we provide new evidence of the association of the entire spectrum of graduate and professional qualifications with underpricing. Specifically, we find that market participants distinguish CEO attainment based on the extent of each title's business orientation. Consequently, they require smaller premia from firms led by CEOs who attended programs with market-focused curricula. The opposite is true for research graduate degrees, which appear to have no effect on the level of initial returns. Second, our results account for the endogenous nature of CEO qualifications. To our knowledge, the most relevant previous research on this topic has been conducted in the context of mutual funds and the various types of awards are considered as exogenously determined. Third, within the framework of signaling theory, this paper is the first to propose that university education can be perceived by outside investors as a signal of quality that associates the more educated Chief Executives with distinguished short-run performance.

Our study relates to the work of Dewar and Dutton (1986), Norburn and Birley (1988), Wiersema and Bantel (1992), Golec (1996), Tyler and Steensma (1998), Chevalier and Ellison (1999), Aliaga (2001), Hitt et al. (2001), Barker and Mueller (2002) and Gottesman and Morey (2006), who investigate the association between CEO qualifications and firm performance. We update their work using a comprehensive sample of US IPO firms and by adjusting for the endogenous nature of the various CEO

attainments. Chevalier and Ellison (1999) examine whether Chief Executives who graduated from high SAT and high GMAT business schools are related to increased fund profitability. We extend their research by including the effect of all types of graduate and professional qualifications on IPO performance. We also provide empirical evidence on the theoretical approach of Norburn and Birley (1988), who suggest that liberal arts education can positively affect the prospects of a company. However, this study contradicts the findings of Gottesman and Morey (2006) by showing that the contribution of professional titles to performance is statistically significant in the IPO context.

The rest of the paper is organized as follows. Section 2 discusses the relevant literature. Section 3 describes our sample and data. Section 4 explains the employed methodology. Section 5 presents the preliminary results. Section 6 examines the association of the various types of graduate and professional qualifications with underpricing. In Section 7, we discuss the results of our empirical analysis, and in Section 8, we provide additional robustness checks. Section 9 concludes the paper.

3.2 LITERATURE REVIEW

3.2.1 Theoretical Framework

The human capital theory establishes the relationship between firm performance and education quality and emphasizes the idea that individuals and society derive economic benefits from investments in people. Its fundamental principle is the notion that people's learning abilities are of comparable value to other resources involved in the production of goods and services (Lucas 1988, 1990). On this basis, advances in education and training are essential as a type of investment in human resources (Aliaga 2001), which constitutes a necessary precondition for future business growth (Becker 1993; Spiegel 1994; Aliaga 2001; Hendricks 2002).

In the framework of human capital theory, successful investment in human resources should focus on what knowledge management theorists call 'articulable knowledge.' This is the type of knowledge acquired in any educational institution. D'Aveni (1989), Spender and Grant (1996) and Hitt et al. (2001) claim that a high level of articulable knowledge is a sign of intellectual potential for an individual and thus graduates from prestigious educational institutions are those with the greatest chances of climbing the corporate ladder faster and eventually reaching the top echelon positions. In

line with this argument, the quality signaling theory aims to reduce the information asymmetries between any two parties (Spence 2002). Spence (1973) illustrates that high-quality prospective employees distinguish themselves via 'the costly signal of rigorous higher education,' proving that the quality of education represents an indication of increased skills and abilities to the market participants.

On the other hand, there is a limited stream of management literature (Collins and Moore 1970; Collins 1971; Mowery and Silverman 1996; Lane and Lubatkin, 1998) advocating the conflict theory of educational stratification. This theory relies on the proposition that society is composed of status groups, which are composed of people who share similar beliefs, and in modern societies, the main activity of educational institutions is 'to teach particular status cultures both in and outside the classroom.' Thus, employers are likely to use education as a criterion for selecting candidates who have been socialized into their status group regardless of any other factors.

In the light of the above framework, we examine the extent to which the amount of articulable knowledge proxied by the quality of CEO education increases the human capital investment made by the firm, as suggested by the human capital theory.

3.2.2 Studies on Educational Characteristics and Performance

The impact of education on firm performance has received attention in both the management and the finance literature. For example, a number of studies establish evidence on the relation of top management education and the ability of the firm to embrace innovative courses of action. Dewar and Dutton (1986) focus specifically on manufacturing companies and suggest that extensive in-depth knowledge measured by executives with an engineering background is crucial for the adoption of innovative strategic changes. Wiersema and Bantel (1992) examine the relationship between the demography of top management teams and corporate strategic change and find that managers with a higher level of academic training in sciences have an increased propensity to support corporate strategic changes. Finally, Norburn and Birley (1988) show that CEOs with degrees from liberal arts institutions are associated with increased levels of firm innovation to exploit future growth opportunities.

Golec (1996) focuses on mutual funds and examines whether fund managers who hold an MBA degree perform better than those who do not have this qualification. He concludes that better mutual fund performance is indeed associated with managers

holding a Master's in Business Administration. Nevertheless, his study is subject to survivorship bias resulting from the exclusion of many non-surviving funds. In a similar vein, Chevalier and Ellison (1999) study the CEO characteristics of 2,029 mutual funds over the period 1988–1995 and find that, contrary to Golec's conclusion, fund performance is not related to the MBA degree. However, they report striking return differences among the managers' undergraduate qualifications. Specifically, they mention that managers who graduated from institutions with high composite SAT scores (which are equal to the average of the upper- and lower-bound verbal scores plus the average of the upper- and lower-bound math scores) have systematically higher risk-adjusted excess returns. Gottesman and Morey (2006) refine the analysis of Chevalier and Ellison by examining the quality of qualifications held by CEOs of mutual funds. Their study reports that the MBA degree has a positive and significant impact on the mutual fund performance but only for those CEOs who hold MBAs from institutions that rank highly in the *Business Week* rankings and require high GMAT entrance scores.

Additionally, fund managers with an MBA from an unranked institution as well as fund managers without an MBA are not associated with superior fund performance. Finally, Gottesman and Morey (2006) include in their study other educational and professional qualifications, such as the CFA designation and other master's qualifications apart from the MBA and PhD degrees. Interestingly, none of these qualifications is significantly related to fund performance. Thus, all the previously mentioned studies point in the direction that there is indeed a varying degree of impact between the different levels and types of CEO educational background and firm performance characteristics.

The relevant literature also reports that the different types of CEO educational background reveal certain 'behavioral patterns of the manager that can also influence firm performance' (Gottesman and Morey 2006). Specifically, Tyler and Steensma (1998) report that top executives with backgrounds in technical education are more likely than others to proceed in the formation of strategic alliances to ensure technological developments for their own firm. Barker and Mueller (2002), in their research on the effect of CEO characteristics on R&D spending, find that it is the type and not the amount of higher education that is important in predicting spending on research and development. According to them, CEOs with engineering-related qualifications are positively associated with R&D spending, while business degrees are found to be insignificant and law school graduates show a negative relation with R&D expenditures. Further, Graham

and Harvey (2002) suggest that Chief Executive Officers who obtain an MBA qualification are more likely to use the net present value (NPV) method for capital budgeting decisions than CEOs without an MBA, who tend to make similar decisions in ways that are not always consistent with the academic decision rules.

Overall, the prior evidence indicates that the CEO educational background essentially shapes the framework within which the leader of an organization makes all the important strategic decisions that have a direct impact on firm performance and viability. This justifies our quest to investigate for first time the relation of CEO educational and professional characteristics on US IPO performance.

3.3 Data Sources and Sample

The sample consists of 1,131 US IPOs with prospectuses available on the Securities and Exchange Commission's (SEC) Electronic Data Gathering Analysis and Retrieval System (EDGAR) over the period 2000–2013. For the formation of the final sample, we collected data on all IPOs floating on US exchanges during this period from the Securities Data Company (SDC) database. This led to an initial sample of 1,881 IPOs. From this initial sample, we excluded REITs, ADRs, closed-end funds, foreign issuers, IPOs with an offer price of less than five dollars and unit offerings. Additionally, IPOs that did not provide information on the first-day closing price as well as the proceeds raised from the IPO were excluded from the sample. This left us with a final sample of 1,131 IPOs.

IPO prospectuses were used for the collection of the offer price, the closing price on the first day of trading, the amount of the proceeds raised from the IPO, the listing venue for the IPO and the year in which the IPO was issued. The offer price and the closing price on the first trading day are employed in the estimation of the level of underpricing against which educational characteristics are tested. The Thompson Reuters Financial database was also employed for the collection of the control variables used in our analysis. In cases of data unavailability, information was extracted from the IPO prospectuses. Data regarding the educational background and other CEO-specific characteristics were hand collected from the Boardex database, while the individual firms' S-1 filings are also used as a supplementary source of information. Moreover,

Boardex was further employed for hand collection of data regarding all types of professional qualifications held by the Chief Executives of our sample.

3.4. Methodology

3.4.1 Measure of Underpricing and Model Specification

The employed methodology in this analysis focuses on the level of underpricing of the IPO firms in our sample. Based on the intuition of Fama and French (1993), we estimate initial returns with the following three-factor model:

$$r = R_f + \beta_3(K_m - R_f) + b_s SMB + b_u HML + \alpha \quad (1)$$

where r is the expected rate of return, R_f is the risk-free rate, Km is the stock market return and β_3 equals the classical stock market beta (β) adjusted for two additional factors. The first is SMB (small market capitalization minus big), which estimates the historic excess returns of small caps over big caps, and the second is HML (high book-to-market ratio minus low), which estimates the historic excess returns of value stocks over growth stocks. The required market data are obtained from the Kenneth French data library.

Then the following model is tested:

$$FF3F = \beta_0 + \beta_1 \, Educational\ Characteristics + \beta_2 \, NYSE\ Listing + \beta_3 \, Market\ Conditions + \beta_4 \, Venture\ Capital\ Backing + \beta_5 \, Dot.com\ Firms + \beta_6 \, Technology\ Firms + \beta_7 \, Regulated\ Industry + \beta_8 \, LnFirmAge + \beta_9 \, Underwriter\ Reputation + \beta_{10} \, Founder\ Ownership + \beta_{11} \, Financial\ Crisis + \beta_{12} \, LnAssets + \beta_{13} \, EPS + \beta_{14} \, ROA + \beta_{15} \, Leverage + \varepsilon_0 \quad \mathbf{(2)}$$

The initial returns are mainly tested against the educational qualifications of the persons serving as the CEO on the day the firm went public for the first time.

In our analysis, we particularly focus on higher education, with an emphasis on whether different types of graduate school awards can influence the amount of money left on the table. The educational characteristics under examination (Appendix A, Panel B) concern whether the CEO holds at least one university qualification, the total number of years that the CEO spent in higher education and whether the CEO holds a Master of Arts, Master of Science, Master in Business Administration, PhD, Medical Doctor or Juris Doctor qualification. In addition, we further examine possible differences in IPO

performance among CEOs who obtained their qualifications at international institutions, Ivy League universities and universities that belong to the Nobel Prize Elite group. An international academic institution is defined as any university located outside the USA. Finally, the Nobel Prize Elite group (Table 3) is a list comprising the fourteen US universities with the highest number of graduates who later won a Nobel Prize.

3.4.2 Control Variable Specification

The regression models include a set of control variables that are found in the relevant IPO literature:

Listing in NYSE is a dummy variable equal to one if the IPO is listed on the New York Stock Exchange. According to Lowry and Shu (2002), companies listed on the New York Stock Exchange are considered less risky and are likely to incur a lower level of underpricing.

Market Conditions is a binary variable equal to unity if the market is 'hot.' According to Ibbotson and Jaffe (1975), this is a state of the economy in which the IPO of common stocks generates unusually high returns and underpricing is also expected to be high.

Venture Backing is a binary variable equal to unity for venture-backed IPOs, which is negatively related to initial returns (Lowry and Shu 2002; Lee and Wahal 2004).

Internet Firms is a dummy equal to one if the company engages in Internet-related business and is expected to have a positive impact on underpricing (Chahine and Goergen 2011).

Regulated Industry is a dichotomous variable that takes the value of one whenever a firm belongs to a regulated industry as defined by the Standard Industrial Classification codes.

LnFirmAge accounts for the number of years between the firm's incorporation and the day of the IPO and is expected to be negatively related to underpricing (Mishra et al. 2001).

Underwriter Reputation is a dummy variable that takes the value of one if a reputable underwriter was involved in the firm's IPO, which is likely to reduce underpricing (Logue et al. 2002; Loughran and Ritter 2004).

Founder Ownership is calculated as the percentage of shares retained by the founders of the firm following the offering and is generally linked to superior underpricing contraction (Chahine and Goergen 2008).

Financial Crisis is a binary variable equal to 1 for the years of the last financial crisis in the USA (2007, 2008, 2009) to control for time-specific factors across the sample period.

The empirical analysis of this research also controls for firm-specific characteristics: *LnTotalAssets* represents the firm's assets prior to the offering as it is anticipated that larger firms experience lower levels of underpricing (Mishra, Randoy and Jenssen 2001). *EPS* is a binary variable equal to unity for positive earnings per share. *Return on Assets* is calculated as the net income before IPO/assets before IPO and *Leverage,* which is estimated as liabilities before IPO/assets before IPO.

3.5 Sample Statistics

Table 1 presents the sample statistics on educational, professional, IPO and firm-specific characteristics. All the variables are defined in Appendix A. The preliminary results show that on average CEOs hold two university degrees and spent 5.63 years in higher education. There are 132 Chief Executives (11.67%) without a university qualification and among them 130 never enrolled in a higher academic institution; alternatively, we identified 4 CEOs who hold 5 degrees. It appears that 41.5% of Chief Executives had up to 4 years of attendance in college, while 58.4% had from 5 to 24 years of studies.

Panel A indicates that 539 (47.6%) CEOs have at least one master's degree (30% of them hold a Master's in Business Administration, 14.16% an MSc and only 3.98% chose to pursue an MA). Concentrating on the more advanced level of graduate studies, we see that 18.3% of top executives hold PhD, Juris Doctor and Medical Doctor qualifications. Among them, 10% are Doctors of Philosophy and 4.2% are Juris Doctors. Interestingly, the JD degrees are strictly obtained from American institutions. We also identify 45 MDs of whom 23 studied in Nobel Elite and international universities. Furthermore, we find that 60 executives hold titles awarded by professional bodies relevant to their occupation.

Panel B provides the preliminary results on the IPO characteristics under examination. Firms that engage in Internet business-related activities account for 16% of IPO firms, 9% belong to the high-tech industry and 32.3% operate in regulated industries. The majority of firms (68%) hired a reputable underwriter to facilitate the listing in an effort to reduce the information asymmetry costs and the associated level of underpricing (Carter and Manaster 1990; Carter 1992; Logue et al. 2002; Loughran and Ritter 2004). Further, less than half of the companies (45%) had venture capital backing, which is generally associated by market participants with increased IPO monitoring and therefore with a lower amount of money left on the table (Sahlman 1990; Gompers 1996; Black and Gilson 1998; Lee and Wahal 2004).

Panel C provides the firm-specific summary statistics. Interestingly, three CEOs were 29 years old when their firm went public and on the other hand one was 76; however, the average CEO age is 51.2. Additionally, the results show that the sample is almost exclusively dominated by males, who account for 96.73%. The mean size of the firms (measured by total assets) is 1,383.2 million dollars.

In Table 2, we examine IPO-specific characteristics in conjunction with the educational background of the CEO as the first attempt to detect whether educational qualifications are associated with particular company attributes. We focus on Chief Executives who hold at least a university degree and then on those with a doctorate title. The results show that the average age of the CEOs with at least one qualification is 51.1, marginally higher than doctorate recipients. In terms of total assets, we find that the bigger firms appoint CEOs with at least one university qualification. Surprisingly, individuals with doctorate degrees are on average appointed to smaller firms. This implies that either no university education or the highest level of education is not a dominant characteristic of Chief Executives in our sample. Additionally, it is worth mentioning that founders' ownership appears to increase as the CEO educational level improves. IPOs led by individuals with at least one degree appear to retain a greater number of shares compared with firms that are led by non-college graduates. In addition, the firms that are led by persons with PhD degrees appear to retain more shares than the rest of the sample.

The supplementary information in Table 3 reveals the degrees awarded by Ivy League and Nobel Elite universities. We also report the rankings of these institutions by the total number of graduates who later won a Nobel Prize as well as the 'Times Higher

Education World University Rankings,' which is an additional measure of the quality of higher education. Harvard University and Stanford University awarded the largest number of MBA degrees, which appear to be the most popular master's qualification. Stanford is also the institution that awarded the largest number of MSc and PhD qualifications compared with any other ranked institution in our analysis.

The correlation matrix of the independent variables is presented in Table 4. Our main variables of interest – *education qualification* and *degrees acquired* – do not exhibit a high correlation with the control variables. This should moderate the econometric difficulties (such as multi-collinearity concerns) in disentangling any effects of the education variables on the level of underpricing during IPO listing.

3.6 Empirical Results

3.6.1 Impact of the Overall Level of Education on IPO Underpricing

We examine the relation between the overall level of higher education as well as the quality of studies of the individuals whose companies went public and the level of underpricing in a multivariate regression analysis. We control for certain IPO- and firm-specific characteristics that affect the initial returns (as described in the methodology section). In addition, we employ heteroskedasticity-robust standard errors adjusted for qualification clustering due to the existence of repeat qualifications in the sample. In our analysis (Table 5), the general level of educational attainment is proxied first by whether the CEO holds at least one university degree and then by the total number of university qualifications. Furthermore, we collect initial evidence on performance differences attributable to university characteristics by investigating significant variations in the level of returns between Chief Executives who attended Ivy League and international higher educational institutions. The reported output presents interesting findings on the impact of education on the amount of money left on the table. Specifically, CEOs with at least one university degree are associated with a lower level of underpricing than those who did not attend college (at the 5% level). The same conclusion holds true for the number of university awards received, which is negative and statistically significant at the 10% level. In terms of university characteristics, we find that Ivy League graduates are linked to superior short-term performance, whereas executives with international education are not.

On the basis of our empirical findings, we conclude that time spent in higher education is associated with better short-run IPO performance. Our results are aligned with those of D'Aveni (1989), Spender and Grant (1996) and Hitt et al. (2001), who, within the framework of the human capital theory, perceive the amount of articulable knowledge as a signal of the individual's skills and abilities. However, the extent to which higher education affects the level of returns remains unclear. The next step in our analysis is to test the impact on underpricing of CEOs with different numbers of awarded degrees. We classify CEOs based on whether they hold one, two, three, four or five academic awards. Each of these categories is individually examined against the level of returns with heteroskedasticity-robust standard errors. The results presented in Table 6 are in line with our previous findings and confirm that there are variations among the different levels of education and that increments in the amount of higher education are related to improved short-run IPO performance. Specifically, we find that CEOs holding from one to four academic qualifications are not related to underpricing. Nevertheless, those with five degrees are significantly related to lower returns at the 5% level. Economically, this finding is interesting since the most educated Chief Executives (in terms of awarded qualifications) are linked to 10.18% less money left on the table.

3.6.2 Impact of Different Types of Graduate and Professional Qualifications on IPO Underpricing

As we mentioned in the previous section, the achievement of an increased number of academic qualifications is associated with better short-run IPO performance. This implicitly suggests that education accumulated in graduate school programs provides the type of knowledge that can affect CEO success. Following the intuition of the relevant literature (Tyler and Steensma 1998; Barker and Mueller 2002; Gottesman and Morey 2006) that particular types of educational background reveal 'behavioral patterns of the manager that affect certain firm attributes,' we focus on the effect of various graduate and professional qualifications on underpricing.

To investigate the sources of the difference in performance, Table 7 (Panel A) presents the output for the master's level of graduate education. The main variables of interest are the types of master's qualifications (MA, MSc and MBA) and each of them

is regressed against underpricing (Fama–French adjusted). Along with these graduate titles, we include an additional regression model in which the main independent variable is a binary indicator equal to unity for the executives who hold any type of professional qualification awarded by a professional body that is relevant to their occupation.

The results show that the CEOs with a Master of Arts degree have better short-run IPO performance than the CEOs with MSc or MBA degrees. The MA award coefficient is negative and significantly different from zero at the 1% level (the other two qualifications are both insignificant). Given that the MA is awarded by liberal arts institutions, our finding complies with the stream of management literature (Dewar and Dutton 1986; Wiersema and Bantel 1992; Norburn and Birley 1998) that proposes that Chief Executives with this type of education are more prone than others to embrace innovation and enforce corporate strategic changes for the benefit of their organization. On the contrary, the professional qualifications are not found to be significantly related to the level of returns.

Similarly, in Table 7 (Panel B), we explore the importance of graduate education at the doctoral level of study in the context of IPO underpricing. Here we consider the Chief Executives who pursued more specialized and lengthy graduate qualifications. To the best of our knowledge, very few studies have been conducted in an empirical framework in this direction and their focus is almost exclusively on the PhD award. In our analysis, along with the doctorate title, we also include CEOs with Juris Doctor and Medical Doctor degrees. These are qualifications that constitute our main variables of interest. The first finding is that the PhD coefficient appears insignificant at the 10% level. Our results suggest that fund performance is not related to the doctorate title. However, we find evidence that the Juris Doctor qualification is strongly related to lower returns. This finding is statistically significant at the 1% level. The same conclusion holds true for the Medical Doctor degree (p=10%).

At this stage of the analysis, it is worth mentioning that so far we have considered the choice of the CEO as exogenously determined. However, some could argue that hiring an executive with a doctorate degree or any other graduate or professional qualification can be a matter of choice between the firm and the executive. If this is the case, the problem of endogeneity could produce unreliable estimations.

To address the issue of endogeneity, we employ a two-step treatment effect model in which the first-stage equation is a probit regression that estimates the probability of hiring a CEO with specific educational or professional qualifications and the second stage controls for endogeneity. To estimate this model, we require an instrument that is correlated with the variable that is considered endogenous but has no effect on the outcome (Wooldridge 2002). In the context of this research, we construct the variable 'Years of Education of the Previous CEO' as the required identification restriction. This variable measures the years of university education of the person who was serving as Chief Executive Officer in a particular company before the person who took the firm public. We argue that the last CEO's education does not have an effect on the amount of money left on the table since the firm remained private when he/she left the office. This variable is constructed with data collected from the BOARDEX database.

Table 8 presents the output of this inquiry. Here, all the graduate and professional qualifications are examined separately in seven regression models. Interestingly, we observe that after controlling for the endogenous nature of CEO accomplishments, the MBA degree is now significantly related to underpricing reduction at the 5% level. Similarly, professional qualifications appear to improve the short-run IPO performance with an even stronger impact (p=1%). The rest of the graduate titles under consideration produce similar results to the OLS analysis presented above.

In sum, after taking into account the problem of endogeneity, we suggest that the Master of Arts, the Juris and Medical Doctor awards, the MBA degree and any professional qualifications are positively related to superior IPO performance. The opposite is true for the Master of Science and the PhD qualifications, which are always found to be insignificant.

3.6.3 Impact of University Characteristics on IPO Underpricing

To address sufficiently the question of whether graduate education improves short-run IPO performance, we also have to take into account the differences arising from the quality of the education that the CEOs received. As we mentioned above, executives with qualifications from Ivy League institutions appear to reduce underpricing, whereas graduates from international colleges do not. Prior empirical work (Golec 1996; Chevalier

and Ellison 1999; Barker and Mueller 2002) establishes evidence for the importance of university reputation by reporting that managers who are business graduates from highly ranked institutions present superior performance to others. As Chevalier and Ellison mention, 'graduates of more prestigious colleges might do better because they are better educated, more capable and have better networks of contacts from whom to gather information.'

To investigate the association of highly reputable master's and doctoral programs with underpricing, we run six treatment effect specification models. Our main variable of interest in each of these models is the type of master's (MA, MBA, MSc) and doctorate (PhD, MD, JD) degree awarded by the Nobel Elite group of universities (Table 3) as specified below. In this analysis, we proxy for university quality firstly with the number of graduates from a particular university who later won a Nobel Prize and secondly with the 'Times Higher Education World University Rankings' list. Each of these measures is tested against the level of initial returns.

At the master's level of education, the results show that CEOs with MA and MBA qualifications from Nobel Elite institutions are strongly related to less underpricing (at p=1%). The MSc degree continues to be insignificant, as in every step of our previous analysis. Additionally, all three categories of doctoral qualifications improve the IPO performance.

3.7 Discussion

A debate that arises from the results of our empirical analysis concerns the differential impact of CEO educational and professional attainment on the short-run IPO performance. We claim that market participants relate specific qualifications with agency cost reduction based on their extent of business relevance and in some instances on the scope and nature of the industry. In this section, we reflect our thoughts on this issue, aiming to support our argument and set the ground for future research. Given the novel nature of the study, we are unable to relate our results directly to the previous evidence; instead, we can draw inference from relevant studies.

Regarding the business relevance of the awards, most of the contemporary authors in this field (Golec 1996; Chevalier and Ellison 1999; Barker and Mueller 2002) show

that the MBA qualification is associated with an improvement in firm performance and higher market valuation. In line with this finding, we report a reduction in returns for the executives with such a qualification at statistically significant levels. Arguably, if MBA holders are well equipped to lead their firm successfully during its 'public life,' market participants' trust on the IPO day appears in their requirement for significantly smaller premia for their capital. As Boyatzis and Renio (1989) point out, what characterizes this qualification is that it equips graduate students with adaptive analytical and entrepreneurial skills. Ketrovic (1999) adds that the MBA curriculum places greater emphasis on information processing issues as well as on quantitative aspects. These are the characteristics that signal ability and create trust among business community members.

Unlike the MBA title, no previous study has been conducted to investigate explicitly the impact of professional qualifications (CFA, CPA, ACA, CMC and any other titles chartered by professional bodies relevant to the holder's occupation) on firm performance. In our analysis, we observe a strong negative relation with the amount of money left on the table. We posit that this is a reasonable and expected outcome considering that these awards essentially serve aims and objectives that are similar in nature to those described above. Additionally, professional titles target the cultivation of the cognitive and information processing capacities of individuals through a curriculum that is standardized and recognized as adequate by the market players. Thus, certified executives possess core competencies that enhance their potential for success in the corporate environment.

The required business relevance of executives' qualifications is not always synonymous with graduate business schools awards. Throughout this study, the Juris Doctor qualification is highly related to underpricing containment. Even though this title is not awarded by business schools, markets reward CEOs specializing in law with a higher level of confidence and a lower level of returns. Useem and Karabel (1986) mention that law schools provide executives with skills that are essential to cope with the difficulties that arise from a turbulent economic environment and eras of increased government regulations.

On the contrary, the title of Doctor of Philosophy does not relate to superior IPO performance. Its strong academic and research orientation does not align with the share

value maximization aspirations of potential investors. As Meyer (2003) suggests, when scientists with a doctoral education are appointed as firm leaders, they may not be concerned with building growing and successful companies, but they may look for new avenues to pursue their research interests. Additionally, in the light of this study, we find that the same conclusion holds for the recipients of the Master of Science degree. This type of qualification is also regarded as less practical than the Master of Business Administration degree. There is strong evidence that of all the graduate qualifications, the highest connection exists between the MSc and the PhD award. This finding points to the conclusion that graduate students consider these two research programs complementary in nature.

Regarding the Master of Arts and the Medical Doctor award, we claim that they are both associated with skills and abilities that are more relevant to certain types of firms. This opinion stems from the observation that the holders of these qualifications lead companies that belong to specific industry classifications. Specifically, over 55% of the CEOs with a Master of Arts work for firms in the health care and industrial sectors, while the M.D. CEOs are exclusively appointed to health care industries. The relevant management literature (Norburn and Birley 1988; Wiersema and Bantel 1992) relates liberal arts education to increased levels of innovation and adoption of strategic change. These elements are regarded as crucial success factors by potential investors, who reward CEOs accordingly with lower returns.

3.8 Additional Robustness Checks

The main conclusion of this study is that certain types of graduate and professional CEO qualifications reduce the agency costs associated with information asymmetries at the time of IPOs and lead to distinguished short-run performance. In this section, we examine the robustness of our findings.

3.8.1 Endogeneity Control

The treatment effect analysis presented above aims to control for the presence of endogeneity in our specification models. For this reason, we construct the variable ‘Years of Education of the Previous CEO’ and use it as an exclusion restriction to obtain unbiased coefficients. In the case that this variable does not sufficiently serve its purpose as a valid instrument in our regression estimations, the problem of endogeneity will persist in the

reported outcome. Thus, to verify the validity of our results, we create an alternative instrument, 'Number of Degrees of the Previous CEO,' which is constructed by collecting data on the attainments of the individuals who served as CEOs prior to their successors who took the company public. The data were collected from the Boardex database. Additionally, we also add the CEO age at the first stage regression.Table 10 reveals that after additional tests, in our underpricing analysis for each individual qualification, the results remain unchanged.

3.8.2 Self-Selection Bias Control

Heckman (1979) argues that self-selection by the data units under examination produces a specification error that leads to biased estimators and proposes a two-stage method to control for it. Earlier, in our preliminary discussion (Table 2), we reported significant differences in the mean of certain IPO-specific characteristics between firms with CEOs who hold a doctorate degree and firms with CEOs who do not. Therefore, we employ the two-stage Heckman method to confirm that selection bias does not affect our regression results. As with the treatment effect estimation model, we employ the variable 'Years of Education of the Previous CEO' to run the first-stage probit regressions. This variable, as shown in Table 11, is always significant at the 1% level across all the types of qualifications, indicating that IPO firms that appointed CEOs with certain educational qualifications in the past are likely to choose new executives with similar qualifications. Out of the first-stage equations, we create the inverse Mills ratio, which is included in the second-stage regressions. The coefficient of the inverse Mills ratio is always insignificant, which means that selection bias does not affect our results.

3.8.3 IPO Industry Classifications

Another concern that we address in this paper relates to the possible impact of industry fixed effects on the reported outcome. Specifically, it could be argued that the relation of CEO graduate and professional qualifications with the level of initial returns may vary across different industry classifications. Thus, to control for unobserved firm heterogeneity, we categorize our sample IPOs according to the one-digit SIC code of the Standard Industrial Classification taxonomy (i.e. i) Consumer Products and Services, ii) Consumer Staples, iii) Energy and Power, iv) Financials, v) Health Care, vi) High Technology, vii) Industrials, viii) Materials, ix) Media and Entertainment, x) Real Estate and xi) Retail). Then, we create eleven binary variables corresponding to each of these classifications and add them to our regression models. Our analysis is conducted

with the treatment effect estimation method with heteroskedasticity-robust standard errors and suppressed constant coefficient terms. The results remain unchanged.

3.8.4 Measure of Underpricing

An additional issue regarding the robustness of the results concerns the measurement of the level of initial returns. Our study relies on the Fama–French three-factor model as it supplements the capital asset pricing model by taking into account differences in the size and value of stocks. To verify that there are no discrepancies in our findings attributable to the method of calculating the money left on the table, we also estimate the amount of raw initial returns (RIR) in the following way:

$$RIR_{i,t} = \frac{P_{i,1} - P_{i,0}}{P_{i,0}} \quad (3)$$

where $RIR_{i,t}$ is the first-day initial return of firm 'i', $P_{i,0}$ is the IPO offer price as it appears in the prospectus of firm 'i' and Pi,1 is the IPO's closing price at the end of the first trading day of firm 'i.' Then, based on the intuition of Chahine and Filatochev (2011), we rerun our analysis using as the dependent variable the natural logarithm of 1 + RIR due to systematic skewness of the first-day returns. Our results continue to hold.

3.9 Conclusion

In this paper, we present initial evidence on the association of CEO academic and professional qualifications with short-run IPO performance. The existing literature in this area comes primarily from the field of management and it is conducted in the light of the human capital theory, which suggests that individuals with increased levels of articulable knowledge (acquired through education) should be regarded as those with the highest potential to succeed in their assigned duties. The empirical evidence is fairly limited to mutual funds but seems to reach the consensus that university education is positively related to innovative courses of action and distinguished financial performance.

Our research provides new insights into the subject by showing that various CEO qualifications relate to underpricing contraction. In particular, we report that graduate education reduces the level of initial returns but only for certain types of awards. After

adjusting for the endogeneity and self-selection bias that may result from CEO–company matching, we report that the agency costs arising from information asymmetries are reduced by those degrees that market participants consider to be business-oriented. The same result holds true for professional qualifications that also aim to improve the entrepreneurial skills of individuals.

Regarding the considerations raised in the introduction, the findings of this study suggest the following. 1) The existence of at least one university qualification and the number of degrees earned are associated with less underpricing. In line with the fundamentals of signaling theory, higher education serves as a proxy for ability and reduces uncertainty for outside investors. 2) At the master's level, the MBA and MA titles have the greatest impact on IPO performance. According to previous research, the first of these awards is well regarded by market players for its business-focused curriculum and the second is linked to individuals who are more likely to enforce strategic changes in their organizations. 3) CEOs with qualifications from US institutions perform better than those with international education in terms of underpricing. Additionally, executives who hold at least one graduate award from an Ivy League university significantly reduce the level of returns. The same conclusion holds for PhD graduates from the Nobel Elite group of colleges. 4) At the doctoral level of education, the Juris and Medical Doctor awards do reduce the initial returns. On the contrary, the PhD is always insignificantly related to IPO performance unless it is awarded by the Nobel Elite group, as mentioned earlier. Overall, this study presents interesting initial evidence on a relatively unexplored but certainly important aspect of the IPO-related literature.

Appendix A: Variables Definition

Panel A: Measures of Abnormal Returns	
Initial returns	The percentage difference on the closing price from offering price on the IPO date
Log (1+ RIR)	The natural logarithm (plus one) of the percentage difference on the closing price from offering price on the IPO date
Fama-French 3 factor adjusted returns	Initial returns adjusted with the Fama-French three factor model
Panel B: Educational Achievement	
Degree	CEO holding university degree (1 if yes)
Number of degrees	Total number of university degrees earned by the CEO
Years of education	CEO years of study in university
Master of Arts	CEO holding Master of Arts (1 if yes)
Master of Science	CEO holding Master of Science (1 if yes)
Master of Business Admin.	CEO holding Master of Business Administration (1 if yes)
Doctor of Philosophy	CEO holding doctorate degree (1 if yes)
Medical Doctor	CEO holding degree in medicine (1 if yes)
Juris Doctor	CEO holding degree in law (1 if yes)
Ivy league degree	CEO holding graduate degree from ivy league university (1 if yes)
International degree	CEO holding graduate degree from international university (1 if yes)
Nobel prize elite degree	CEO holding graduate degree from Nobel prize elite university (1 if yes)
Professional qualifications	CEO holding any type of professional qualification (1 if yes)
Panel C: IPOs Characteristics	
Listing in NYSE	Dummy variable: one for NASDAQ floated IPO, zero otherwise.
Market conditions	Dummy variable: one for IPOs listed in periods with high number of offerings, zero otherwise
Venture capital	Dummy variable: one for venture backed firms, zero otherwise
Technology IPOs	Dummy variable: one for IPO firms with SIC codes 3571, 3572, 3575, 3577, 3578 (computer hardware), 3661, 3663, 3669 (communications equipment), 3671, 3672, 3674, 3675, 3677, 3678, 3679 (electronics), 3812 (navigation equipment), 3823, 3825, 3826, 3827, 3829 (measuring and controlling devices), 3841, 3845 (medical instruments), 4812, 4813 (telephone equipment), 4899 (communications services), and 7371, 7372, 7373, 7374, 7375, 7378, and 7379 (software).
Internet IPOs	Dummy variable: one for internet firm IPO, zero otherwise. Internet IPOs are classified those IPOs with business description section in the Thomson Financial SDC characterized by the words “Internet”, “Online”, “eBusiness”, “eCommerce”, and/or “Website”.
Regulated industry	IPO firms with SIC codes of 4900–4939 (electric and gas), 1300 (oil and gas extraction), 4000– 4700 (transportation), 4800 (telecommunications), 4950–4959 (sanitary services) and all 6000s (financial companies).
Underwriter characteristics	Dummy variable: one for most prestigious underwriters, zero otherwise. Prestige rankings are from Jay Ritter's underwriter database
Share overhang	Proportion of given ownership (OWN) during the going public process.
Credit crunch crises	Dummy variable: one for IPO within the financial crisis of 2007–2008, zero otherwise.
Market return	Market return is the compounded daily return realized by the CRSP value weighted index within the 20 trading days preceding the IPO day.
Industry classifications	Dummy variable: one for industrial classified companies, zero otherwise.
Panel D: Firm Characteristics	
CEO age	The years of age of the individual serving as CEO at the day of IPO
Gender	Dummy variable: one for male CEOs, zero otherwise
Total assets	The book value of assets in the last fiscal year prior to IPO.
Return on assets (ROA)	The return on assets in the last fiscal year prior to IPO.
Leverage	Total liabilities over total assets in the last fiscal year prior to IPO.

Table 1: Descriptive Statistics

Descriptive Statistics for all variables used in the analysis are presented. The variables include CEO graduate educational qualifications both at the Master (MA, MSc and MBA) and Doctoral (PhD, JD and MD) level of study. Professional Qualifications are also included. Additionally, we present IPO and Firm Specific characteristics. As IPO specific we define the Capital Raised, NYSE listings, Market Conditions (proxied by hot and cold periods), Venture Capital Backed IPOs, Internet, High-Tech and Regulated Industries, Existence of a reputable underwriter, Retained ownership, the years of financial crisis and Market return. In the Firm specific characteristic we include CEO age and gender, Total assets, Revenue, Earnings Per share, ROA and leverage. The sample consists of 1.129 IPOs announced from the 1st of January 2000 to the 31st of June 2013. IPO data were collected from the Securities Data Company (SDC) Database. Accounting data were retrieved from CRSP and Compustat Databases. Lastly, CEO educational and professional characteristics were hand collected from BOARDEX.

Panel A: Educational Characteristics

	N	Mean	SD
Master of Science	160	0.141	0.348
Master in Business Administration	334	0.296	0.456
Master of Arts	45	0.039	0.195
Doctorate (PhD) degree	114	0.100	0.301
Juris Doctor (JD) degree	48	0.042	0.201
Medical Doctor (MD) degree	45	0.039	0.195
Professional qualifications	60	0.022	0.184
Years of Education	1129	5.63	3.33
Number of degrees	999	1.61	0.904

Panel B: IPO Characteristics

	N	Mean	SD
Listing in NYSE	351	0.310	0.46
Market conditions (listings in hot market periods)	731	0.646	0.47
Venture capital backing	510	0.450	0.49
Dot.com firm	181	0.160	0.36
Technology firm	102	0.090	0.28
Regulated industry	366	0.323	0.46
Underwriter reputation (firms with reputable under.)	769	0.679	0.46
Overhang	1131	3.386	3.80
Financial crisis (listings during the crisis)	158	0.139	0.34

Panel C: Firm Characteristics

	N	Mean	SD
CEO age	1131	51.22	8.12
CEO gender (male CEOs)	1094	0.96	0.177
Total assets	1131	1383.2	11657.7
Earnings per share	1131	0.50	0.50
Return on assets	1131	-0.53	8.81
Leverage	1131	1.38	1.99

Table 2: Summary Statistics

The table presents additional summary statistics for the variables in our sample which consists of 1.129 US IPOs announced from the 1st of January 2000 to the 31st of June 2013. The sample is further classified in four categories. In the first two we examine the mean difference in IPO and firm specific characteristics between companies run by CEOs with at least one University qualification and firms with CEOs who never attended college. The other two categories also report the mean difference of the same variables by classifying firms based on whether the CEO holds a PhD title.

Panel A: IPO Characteristics										
	Mean	N	Mean	N	(p-value)	Mean	N	Mean	N	(p-value)
	With Any Degree					With Doctor of Philosophy				
Listing in NYSE	0.25	999	0.32	132	0.11	0.027	114	0.015	1017	0.00
Market conditions	0.64	999	0.67	132	0.60	0.041	114	0.015	1017	0.03
Venture capitalist	0.47	999	0.30	132	0.00	0.041	114	0.015	1017	0.00
Technology firm	0.97	999	0.38	132	0.03	0.02	114	0.01	1017	0.14
Dot.com firm	0.17	999	0.09	132	0.02	0.04	114	0.01	1017	0.00
Regulated industry	0.34	999	0.18	132	0.00	0.25	114	0.33	1017	0.10
Underwriter	0.69	999	0.60	132	0.05	0.67	114	0.68	1017	0.91
Overhang	0.46	999	0.85	132	0.08	0.56	114	0.25	1017	0.00
Financial crisis	0.15	999	0.1	132	0.15	0.032	114	0.010	1017	0.79
Panel B: Firm Characteristics										
CEO age	51.1	999	52.5	132	0.06	51.51	114	51.19	1017	0.68
Gender	0.97	999	0.95	132	0.16	0.95	114	0.97	1017	0.21
Firm age	24.85	999	15.3	132	0.02	18.6	114	22.1	1017	0.10
Total assets	1506.6	999	449.2	132	0.33	452.98	114	1487.5	1017	0.37
Earnings per share	0.48	999	0.7	132	0.00	0.29	114	0.53	1017	0.00
Return on assets	-0.57	999	-0.11	132	0.56	-0.65	114	-0.51	1017	0.87
Leverage	1.44	999	0.99	132	0.015	0.21	114	0.06	1017	0.01

Table 3: Sample descriptive statistics by university ratings

Table 3, supplements our descriptive analysis by providing the list of Nobel Elite group of Universities examined in this study. This is a group of 30 colleges constructed by ranking Universities by the number of graduates who later won a Nobel Prize. Ivy-League Universities constitute a subsample of this group and are included in the table. Universities with the same number of Nobel Laureates are ranked by the 'The Times Higher Education World University Rankings list'. The table reports which and how many graduate qualifications were awarded by these colleges to the CEOs in our sample.

	NOBEL	Ranking	MSc	MA	MBA	PhD	JD	MD	IVY
University of Harvard (MT)	***69***	***1***	***1***	***4***	***49***	***4***	***5***	***2***	***YES***
Columbia University (NY)	***39***	***13***	***4***	***2***	***10***	***1***	***0***	***2***	***YES***
University of Chicago (IL)	**31**	**14**	**1**	**1**	**16**	**2**	**1**	**1**	**NO**
MIT (MT)	**30**	**2**	**12**	**0**	**3**	**5**	**0**	**0**	**NO**
Berkeley (CA)	**30**	**5**	**1**	**0**	**3**	**5**	**0**	**0**	**NO**
Yale University (CN)	***20***	***10***	***1***	***2***	***3***	***1***	***1***	***0***	***YES***
Cal. Inst. of Tech. (CA)	**18**	**11**	**1**	**0**	**0**	**1**	**0**	**0**	**NO**
Johns Hopkins (MD)	**15**	**19**	**1**	**1**	**0**	**0**	**0**	**3**	**NO**
Princeton University (NJ)	***14***	***7***	***2***	***1***	***0***	***4***	***0***	***0***	***YES***
Cornell University (NY)	***13***	***17***	***1***	***0***	***4***	***0***	***0***	***0***	***YES***
Stanford University (CA)	**10**	**6**	**17**	**1**	**28**	**7**	**1**	**0**	**NO**
University of Illinois (IL)	**10**	**24**	**1**	**0**	**2**	**1**	**0**	**0**	**NO**
New York University (NY)	**9**	**29**	**1**	**1**	**8**	**2**	**0**	**0**	**NO**
Univ. of Michigan (MI)	**8**	**18**	**1**	**2**	**1**	**1**	**0**	**1**	**NO**
Univ. of Minnesota (MN)	**8**	**46**	**3**	**0**	**1**	**1**	**1**	**2**	**NO**
Univ. of Pennsylvania (PN)	***7***	***18***	***2***	***2***	***15***	***1***	***0***	***1***	***YES***
Carnegie Mellon Univ.(PA)	**7**	**24**	**3**	**0**	**1**	**2**	**0**	**0**	**NO**
Univ. of Pittsburgh (PA)	**3**	**78**	**2**	**0**	**3**	**1**	**0**	**0**	**NO**
Dartmouth College (NH)	***3***	***126***	***1***	***0***	***7***	***0***	***0***	***0***	***YES***
University of Texas (TX)	**2**	**27**	**0**	**1**	**4**	**3**	**1**	**0**	**NO**
Brown University (RI)	***2***	***52***	***2***	***0***	***0***	***0***	***1***	***2***	***YES***
Univ. of Notre Dame (IN)	**2**	**90**	**0**	**1**	**0**	**1**	**1**	**0**	**NO**
Univ. of Colorado (CO)	**2**	**97**	**1**	**0**	**2**	**0**	**0**	**0**	**NO**
University of Florida (FL)	**2**	**128**	**0**	**0**	**1**	**1**	**0**	**1**	**NO**
Boston University (MA)	**1**	**50**	**2**	**1**	**3**	**0**	**0**	**1**	**NO**
Indiana University (IN)	**1**	**132**	**0**	**0**	**4**	**0**	**0**	**1**	**NO**
University of Kansas (KA)	**1**	**-**	**1**	**0**	**0**	**2**	**0**	**1**	**NO**
Lehigh University (PA)	**1**	**-**	**2**	**0**	**1**	**1**	**0**	**0**	**NO**
University of Virginia (VA)	**0**	**112**	**0**	**1**	**3**	**0**	**4**	**0**	**NO**
Arizona State Univ. (AZ)	**0**	**146**	**1**	**1**	**3**	**0**	**1**	**0**	**NO**

Table 4: Correlation matrix

The table reports paiwise correlation for the variables employed in our analysis. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX. Panel A reports correlations of control variables. Panel B reports correlations of CEO educational qualifications.

	Panel A: IPO characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.	NYSE listing													
2.	Marker condition	-0.21												
3.	Earnings per share	0.27	-0.08											
4.	Return on assets	0.03	0.04	0.07										
5.	Leverage	-0.12	0.08	-0.24	0.17									
6.	Venture Capital	-0.35	0.07	-0.37	-0.01	0.20								
7.	Dot. Com firm	-0.19	0.25	0.20	-0.02	0.23	0.08							
8.	Technology firm	-0.02	-0.14	-0.08	0.05	0.19	0.15	-0.02						
9.	Regulated industry	-0.17	0.06	-0.12	-0.01	0.05	-0.03	0.01	0.01					
10.	Underwriter	0.31	-0.01	0.07	-0.02	0.09	0.16	0.11	0.05	0.05				
11.	Overhang	-0.05	0.10	-0.06	0.01	0.02	-0.17	-0.04	0.04	0.01	-0.04			
12.	Financial crisis	-0.01	0.09	0.02	-0.34	-0.41	-0.21	-0.12	-0.17	0.02	-0.01	-0.06		
13.	Log Assets	0.47	-0.10	0.38	0.22	-0.11	-0.23	-0.14	-0.24	0.3	-0.01	-0.03	0.01	
14.	Firm age	0.13	0.04	0.24	-0.07	-0.12	-0.09	-0.07	-0.13	0.04	-0.02	0.05	0.34	0.14

	Panel B: Educational Characteristics	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
15.	Master of Science								
16.	Master of Arts	-0.06							
17.	Master of Business Administration	-0.10	-0.01						
18.	Doctor of Philosophy	0.18	0.07	-0.15					
19.	Medical Doctor	-0.01	0.05	0.12	0.2				
20.	Juris Doctor	-0.07	0.01	-0.04	-0.07	0.01			
21.	Professional qualification	-0.02	-0.02	-0.01	-0.41	-0.04	0.02		
22.	Years of Education	0.3	0.19	0.24	0.52	0.46	0.16	0.29	
23.	Number of degrees	0.14	0.07	0.22	0.12	0.13	0.18	0.25	0.16

Table 5: Cross sectional regression analysis (OLS) of general education characteristics

The table presents results of the cross sectional OLS regression analysis of the total number of degrees held by the CEO, the existence of at least one University qualification and the impact of Ivy-League and International Education on underpricing. All these variables are regressed against the returns (Fama-French adjusted). The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX. Next to the variable name we report the t-statistics followed by the heteroscedasticity robust standard errors that appear in parentheses. See Appendix A for definitions of the variables. All regressions control for year fixed effects whose coefficients are suppressed. The *, **, ***, indicate statistical significance at the 10%, 5% and 1% respectively

VARIABLES	(OLS) Existence of degree	(OLS) Number of degrees	(OLS) Ivy-league	(OLS) International
Constant	-3.1	-0.68	-3.2	-4.8
	(6.7)	(7.04)	(6.1)	(6.07)
NYSE listing	-3.7	-3.5*	-3.7**	-3.94**
	(1.38)	(1.84)	(1.85)	(1.85)
Market condition	5.4	5.42***	5.43***	5.39***
	(3.06)	(1.8)	(1.84)	(1.83)
Earnings per share	3.6	3.53*	3.68*	3.75*
	(1.12)	(2.1)	(2.04)	(2.06)
Return on assets	0.02	0.03**	0.03*	0.026*
	(0.02)	(0.01)	(0.01)	(0.02)
Leverage	-0.15	-0.12	-0.13	-0.21
	(0.33)	(0.3)	(0.4)	(0.39)
Venture capital	5.7	6.23**	5.76**	5.4**
	(2.21)	(2.6)	(2.7)	(2.74)
Dot.com firm	35.84**	36.2***	35.88***	35.8***
	(2.17)	(5.38)	(5.34)	(5.33)
Technology firm	-6.5	-6.62	-6.36	-6.9
	(3.11)	(4.33)	(4.3)	(4.37)
Regulated industry	7.9	7.96***	7.73***	7.39***
	(1.68)	(2.43)	(2.4)	(2.34)
Underwriter	2.62**	2.72	2.6	2.6
	(0.17)	(2.28)	(2.2)	(2.2)
Overhang	1.35	1.38**	1.36**	1.34**
	(0.26)	(0.65)	(0.65)	(0.63)
Financial crisis	2.07	2.4	2.06	1.82
	(0.45)	(2.29)	(2.2)	(2.3)
Lnassets	0.02	-0.04	0.01	0.08
	(1.3)	(0.876)	(0.873)	(0.87)
Lnfirmage	-0.14	-0.195	-0.25	-0.16
	(1.06)	(0.835)	(0.8)	(0.83)
Existence of degree	-1.53**			
	(0.1)			
Number of degrees		-2.33*		
		(1.32)		
Ivy-league			-4.85*	
			(2.79)	
International				7.42
				(5.11)
N	1.129	1.129	1.129	1.129
Adjusted.-R^2	0.18	0.19	0.19	0.19

Table 6: University degrees obtained - cross sectional regressions on CEO qualifications

The table presents the OLS regression results for the different number of University qualifications held by CEOs. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX. Regarding the number of acquired degrees as the main variable of interest, and employing heteroscedasticity robust standard errors we report our findings. See Appendix A for definitions of the variables. All regressions control for year fixed effects whose coefficients are suppressed. The *, **, ***, indicate statistical significance at the 10%, 5% and 1% respectively.

VARIABLES	(OLS) 1-degree	(OLS) 2-degrees	(OLS) 3-degree	(OLS) 4-degrees	(OLS) 5-degrees
Constant	-6.49	-4.6	-4.9	-5.2	-5.1
	(4.04)	(4.01)	(3.85)	(3.79)	(3.79)
NYSE listing	-4.2**	-3.9**	-4.34**	-4.15**	-4.12**
	(1.7)	(1.77)	(1.8)	(1.78)	(1.7)
Market condition	5.37***	5.31***	5.43***	5.41***	5.31***
	(1.83)	(1.83)	(1.82)	(1.82)	(1.82)
Earnings per share	3.95*	3.82*	3.89*	3.867*	3.92*
	(2.06)	(2.07)	(2.07)	(2.06)	(2.06)
Return on assets	0.043***	0.04**	0.04**	0.03**	0.04**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Leverage	-0.2	-0.26	-0.23	-0.28	-0.27
	(0.47)	(0.48)	(0.47)	(0.48)	(0.47)
Venture capital	5.62**	5.38**	5.49**	5.46**	5.27**
	(2.53)	(2.46)	(2.46)	(2.47)	(2.47)
Dot.com firm	37.16***	37.06***	37.42***	37.21***	37.06***
	(5.38)	(5.38)	(5.44)	(5.4)	(5.39)
Technology firm	-7.29*	-7.01	-7.16*	-6.97	-6.93
	(4.34)	(4.32)	(4.34)	(4.32)	(4.32)
Regulated industry	7.04***	7.23***	7.21***	7.19***	7.21***
	(2.35)	(2.37)	(2.36)	(2.3)	(2.36)
Underwriter	2.82	2.85	2.9	2.8	2.8
	(2.46)	(2.47)	(2.47)	(2.47)	(2.47)
Overhang	1.37**	1.36**	1.36**	1.35**	1.37**
	(0.65)	(0.65)	(0.66)	(0.65)	(0.6)
Financial crisis	3.16	3.07	3.12	2.94	3.02
	(2.29)	(2.27)	(2.2)	(2.28)	(2.28)
Market return	2.21***	2.25***	2.22***	2.23***	2.24***
	(5.4)	(5.3)	(5.4)	(5.3)	(5.7)
Lnassets	0.12	0.66	0.04	0.01	0.05
	(0.99)	(1.01)	(1.01)	(1.01)	(1.01)
Lnfirmage	0.01	0.01	0.02	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
One degree	3.68				
	(2.48)				
Two degrees		-1.38			
		(2.22)			
Three degrees			-4.42		
			(3.35)		
Four degrees				-10.2	
				(9.46)	
Five degrees					-10.06**
					(4.62)
N	1.129	1.129	1.129	1.129	1.129
Adjusted R^2	0.2	0.19	0.2	0.2	0.19

Table 7: The effect of CEO Master, Doctoral and Professional qualifications on IPO underpricing

The table reports the results of the impact of different types of graduate and Professional Qualifications on underpricing. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX. Analysis is conducted in a cross-sectional multivariate OLS setting. See Appendix A for definitions of the variables. All regressions control for year fixed effects whose coefficients are suppressed. See Appendix A for definitions of the variables. Heteroscedasticity robust standard errors are used. The *, **, ***, indicate statistical significance at the 10%, 5% respectively

Panel A: OLS output on Master and Professional Qualifications

VARIABLES	(OLS) MA	(OLS) MSc	(OLS) MBA	(OLS) Prof. Qual.
Constant	-4.1	-4.21	-4.119	-4.39
	(6.04)	(6.03)	(6.188)	(6.03)
NYSE listing	-3.91**	-3.8**	-3.66*	-3.86**
	(1.8)	(1.8)	(1.89)	(1.84)
Market condition	5.4***	5.5***	5.54***	5.52***
	(1.8)	(1.83)	(1.84)	(1.83)
Earnings per share	3.76*	3.82*	3.92*	3.78*
	(2.05)	(2.02)	(2.06)	(2.05)
Return on assets	0.03*	0.029*	0.02*	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.14	-0.16	-0.15	-0.16
	(0.39)	(0.3)	(0.39)	(0.39)
Venture capital	5.71**	5.8**	5.77**	5.7**
	(2.75)	(2.77)	(2.75)	(2.75)
Dot.com firm	36.01***	35.82***	35.74***	35.79***
	(5.36)	(5.379)	(5.34)	(5.35)
Technology firm	-5.99	-6.58	-6.51	-6.56
	(4.29)	(4.32)	(4.32)	(4.31)
Regulated industry	7.64***	7.93***	7.85***	7.79***
	(2.4)	(2.47)	(2.44)	(2.44)
Underwriter	2.4	2.63	2.66	2.62
	(2.27)	(2.3)	(2.29)	(2.28)
Overhang	1.37**	1.36**	1.36**	1.36**
	(0.6)	(0.65)	(0.64)	(0.65)
Financial crisis	2.08	1.99	2.13	2.01
	(2.28)	(2.29)	(2.28)	(2.29)
Lnassets	0.03	0.01	0.01	0.02
	(0.87)	(0.8)	(0.87)	(0.87)
Lnfirmage	-0.08	-0.14	-0.12	-0.14
	(0.82)	(0.82)	(0.83)	(0.83)
MA	-7.03**			
	(3.01)			
MSc		-1.43		
		(3.25)		
MBA			-1.568	
			(2.178)	
Professional Qualif.				-1.1
				(2.32)
N	1.129	1.129	1.129	1.129
Adjusted.-R^2	0.19	0.18	0.18	0.18

Panel B: OLS output on Doctoral qualifications

VARIABLES	(OLS) PhD	(OLS) JD	(OLS) MD
Constant	-5.3	-4.69	-4.7
	(0.01)	(0.01)	(0.01)
NYSE listing	-4.03**	-4.15**	-4.23**
	(1.8)	(1.77)	(1.78)
Market cond.	5.35***	5.42***	5.41***
	(1.8)	(1.81)	(1.82)
Earn per sh.	3.95*	3.81*	3.57*
	(2.08)	(2.06)	(2.1)
Return on assets	0.03**	0.03**	0.03**
	(0.02)	(0.01)	(0.01)
Leverage	-0.28	-0.27	-0.25
	(0.4)	(0.47)	(0.47)
Venture capital	5.15**	4.96**	5.65**
	(2.4)	(2.48)	(2.46)
Dot.com firm	37.05***	36.97***	37.06***
	(5.36)	(5.37)	(5.38)
Technology firm	-6.83	-6.69	-7.37*
	(4.28)	(4.32)	(4.35)
Regulated industry	7.32***	7.37***	6.83***
	(2.42)	(2.37)	(2.37)
Underwriter	2.81	2.79	2.73
	(2.48)	(2.47)	(2.47)
Overhang	1.34**	1.34**	1.36**
	(0.65)	(0.65)	(0.66)
Financial crisis	2.98	3.1	3.02
	(2.28)	(2.2)	(2.28)
Lnassets	0.77	0.04	0.01
	(1.01)	(1.01)	(1.01)
Lnfirmage	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)
PhD	1.49		
	(5.21)		
Juris Doctor		-8.57***	
		(2.53)	
Medical Doctor			-7.28*
			(4.08)
N	1.129	1.129	1.129
Adjusted R^2	0.19	0.2	0.2

Table 8: Treatment effects regression model for graduate qualifications

The table presents the results of the treatment effect regression model analysis of the influence of CEO graduate and professional qualifications on the level of underpricing. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX. The six first specification models have as main independent variable a binary indicator equal to unity when the CEO holds the following graduate qualifications respectively: MA, MSc, MBA, PhD, JD, MD. The last specification model has as main variable a binary indicator which takes the value of one if the CEO holds any professional qualifications. The presented results are based on a two stage procedure: First, we run a probit regression model for each of these qualifications in order to obtain the fitted probabilities of an IPO firm hiring a CEO with a certain degree and then we use these fitted values as instruments to evaluate the impact of each award on the level of returns. The columns below present the results from the second stage equations.

VARIABLES	(T.E) MA	(T.E) MSc	(T.E) MBA	(T.E) PhD	(T.E) JD	(T.E) MD	(T.E) Prof. Qual.
Constant	-3.41	-3.9	-1.5	-3.7	-2.5	-2.5	-2.5
	(6.05)	(6.08)	(6.6)	(6.1)	(6.1)	(6.08)	(6.1)
NYSE listing	-4.05**	-3.74**	-2.586	-4.18**	-3.8**	-4.0 **	-3.5*
	(1.8)	(1.8)	(1.9)	(1.9)	(1.8)	(1.8)	(1.9)
Market condition	5.18***	5.66***	5.29***	5.52***	5.6***	5.61***	4.72**
	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.8)	(1.9)
Earnings per share	3.81*	3.95**	4.1**	3.62*	3.62*	3.1	4.19**
	(2.03)	(1.9)	(2.03)	(2.1)	(2.06)	(2.1)	(2.1)
Return on assets	0.03**	0.03*	0.03**	0.031*	0.028*	0.036**	0.04**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.12	-0.17	-0.1	-0.15	-0.16	-0.15	-0.1
	(0.39)	(0.38)	(0.39)	(0.39)	(0.38)	(0.39)	(0.39)
Venture capital	5.65**	6.05**	6.01**	6.19**	4.89*	6.5**	5.27*
	(2.7)	(2.4)	(2.6)	(2.8)	(2.7)	(2.7)	(2.8)
Dot.com firm	35.83***	35.97***	35.6***	35.9***	35.37***	35.7***	35.12***
	(5.3)	(5.4)	(5.2)	(5.3)	(5.3)	(5.3)	(5.2)
Technology firm	-6.19	-6.61	-6.28	-7.15*	-5.82	-7.5*	-6.8
	(4.2)	(4.3)	(4.3)	(4.2)	(4.2)	(4.3)	(4.4)
Regulated industry	7.57***	8.27***	8.08***	7.39***	8.23***	6.8***	8.17***
	(2.4)	(2.5)	(2.4)	(2.5)	(2.5)	(2.4)	(2.5)
Underwriter	2.49	2.76	2.52	2.73	2.5	2.44	1.7
	(2.2)	(2.3)	(2.3)	(2.28)	(2.27)	(2.26)	(2.33)
Overhang	1.39**	1.37**	1.35**	1.39**	1.3**	1.37**	1.2**
	(0.6)	(0.65)	(0.61)	(0.66)	(0.64)	(0.65)	(0.61)
Financial crisis	2.14	1.98	3.03	1.99	2.18	2.13	2.19
	(2.2)	(2.27)	(2.3)	(2.2)	(2.3)	(2.31)	(2.4)
Lnassets	-0.02	-0.05	-0.02	-0.003	-0.007	-0.08	0.28
	(0.8)	(0.87)	(0.87)	(0.86)	(0.87)	(0.8)	(0.86)
Lnfirmage	-0.049	-0.14	-0.22	-0.14	-0.32	-0.22	-0.18
	(0.8)	(0.82)	(0.84)	(0.83)	(0.84)	(0.83)	(0.88)
MA	-18.97***						
	(4.6)						
MSc		-5.17					
		(5.9)					
MBA			-11**				
			(4.5)				
PhD				-5.18			
				(6.2)			
Juris Doctor					-21.66***		
					(4.7)		
Medical Doc.						-17.68***	
						(5.3)	
Profes. Qualif.							-32.38***
							(8.9)
N	1.129	1.129	1.129	1.129	1.129	1.129	1.129
Pseudo-R^2	0.13	0.16	0.07	0.4	0.12	0.4	0.11

Table 9: Treatment effects regression model for graduate qualifications

The table presents the results of the treatment effect regression model analysis of the influence of University specific characteristics on underpricing. Our specification models have as main independent variable the various types of graduate characteristics awarded from the Nobel Elite group of Universities. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX.

VARIABLES	(T.E.) FF3F	(T.E.) FF3F	(T.E.) FF3F	(T.E.) FF3F	(T.E.) FF3F	(T.E.) FF3F
Constant	-3.5	-4.3	-2.16	-3.67	-3.7	-3.3
	(5.9)	(6.02)	(6.3)	(6.06)	(6.05)	(6.02)
NYSE listing	-3.6**	-3.85**	-2.2	-4.25**	-3.86**	-3.9**
	(1.8)	(1.8)	(1.89)	(1.8)	(1.83)	(1.83)
Market cond.	5.07***	5.49***	5.47***	5.43***	5.54***	5.55***
	(1.8)	(1.81)	(1.87)	(1.8)	(1.81)	(1.8)
Earn. per share	3.87*	3.8*	3.95*	3.85*	3.7*	3.42*
	(2.04)	(1.94)	(2.05)	(2.04)	(2.1)	(2.07)
Ret on assets	0.03**	0.02*	0.03**	0.03*	0.02*	0.031**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
Leverage	-0.15	-0.16	-0.23	-0.09	-0.2	-0.16
	(0.39)	(0.38)	(0.38)	(0.4)	(0.3)	(0.39)
Venture cap.	5.89**	5.71**	5.66**	6.09**	5.49**	6.04**
	(2.76)	(2.73)	(2.74)	(2.7)	(2.7)	(2.73)
Dot.com firm	35.94***	35.78***	36.15***	35.54***	35.7***	35.52***
	(5.31)	(5.33)	(5.36)	(5.31)	(5.3)	(5.29)
Tech. firm	-6.14	-6.57	-6.14	-6.82	-6.1	-6.75
	(4.27)	(4.2)	(4.41)	(4.3)	(4.3)	(4.31)
Regulated ind.	7.29***	7.81***	7.56***	7.38***	7.97***	7.43***
	(2.4)	(2.46)	(2.4)	(2.46)	(2.4)	(2.43)
Underwriter	2.32	2.6	2.67	2.78	2.76	2.41
	(2.26)	(2.2)	(2.2)	(2.26)	(2.2)	(2.27)
Overhang	1.39**	1.35**	1.33**	1.45**	1.35**	1.37**
	(0.66)	(0.64)	(0.63)	(0.66)	(0.64)	(0.65)
Financial crisis	1.94	2.01	2.95	2.05	1.94	1.9
	(2.28)	(2.27)	(2.34)	(2.29)	(2.27)	(2.2)
Lnassets	-0.03	0.02	-0.05	-0.01	-0.01	-0.01
	(0.85)	(0.86)	(0.87)	(0.86)	(0.86)	(0.8)
Lnfirmage	-0.06	-0.14	-0.26	-0.271	-0.2	-0.2
	(0.82)	(0.82)	(0.84)	(0.83)	(0.82)	(0.83)
Nobel MA	-19.59***					
	(5.9)					
Nobel MSc		-0.11				
		(9.48)				
Nobel MBA			-13.78***			
			(4.72)			
Nobel PhD				-14.54*		
				(8.26)		
Nobel JD					-15.75***	
					(6.02)	
Nobel MD						-17.21**
						(7.17)
N	1.129	1.129	1.129	1.129	1.129	1.129
Pseudo-R^2	0.21	0.16	0.07	0.32	0.13	0.35

Table 10: Robustness tests on treatment effect estimation models

The table presents regression output of underpricing analysis on CEO attainments based on employment of the variable 'Number of previous CEO qualifications' as new exclusion restriction. The reported shows the obtained results from the treatment effect method of estimation for each individual qualification.

VARIABLES	(T.E.) MA	(T.E) MSc	(T.E.) MBA	(T.E.) PhD	(T.E.) JD	(T.E.) MD	(T.E.) Prof. Qual.
Constant	-3.3	-3.7	-1.7	-3.4	-2.5	-2.2	-7.3
	(6.1)	(6.1)	(6.6)	(6.1)	(6.13)	(6.1)	(6.14)
NYSE listing	-4.06**	-3.7**	-2.6	-4.3**	-3.8**	-4.02**	-4.4**
	(1.8)	(1.83)	(1.9)	(1.9)	(1.83)	(1.85)	(2.05)
Market cond.	5.14***	5.72***	5.3***	5.53***	5.64***	5.62***	6.78***
	(1.87)	(1.8)	(1.89)	(1.81)	(1.81)	(1.82)	(1.98)
Earn. per share	3.82*	4.01**	4.09**	3.52*	3.62*	2.9	3.14
	(2.04)	(1.9)	(2.03)	(2.11)	(2.05)	(2.11)	(2.2)
Ret on assets	0.03**	0.03**	0.03**	0.03*	0.0*	0.04**	0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Leverage	-0.12	-0.18	-0.1	-0.14	-0.16	-0.14	-0.27
	(0.39)	(0.37)	(0.39)	(0.4)	(0.38)	(0.39)	(0.42)
Venture cap.	5.65**	6.18**	5.9**	6.44**	4.91*	6.65**	6.45**
	(2.7)	(2.7)	(2.7)	(2.72)	(2.78)	(2.74)	(2.85)
Dot.com firm	35.8***	36.04***	35.6***	35.96***	35.3***	35.69***	36.86***
	(5.3)	(5.36)	(5.2)	(5.32)	(5.27)	(5.3)	(5.43)
Tech. firm	-6.21	-6.63	-6.3	-7.46*	-5.83	-7.68*	-6.09
	(4.28)	(4.3)	(4.36)	(4.3)	(4.28)	(4.36)	(4.36)
Regulated ind.	7.56***	8.44***	8.06***	7.16***	8.2***	6.7***	7.18***
	(2.42)	(2.46)	(2.43)	(2.5)	(2.4)	(2.4)	(2.55)
Underwriter	2.5	2.83	2.53	2.8	2.5	2.41	4.01*
	(2.26)	(2.28)	(2.28)	(2.29)	(2.27)	(2.27)	(2.39)
Overhang	1.39**	1.37**	1.35**	1.41**	1.33**	1.37**	1.53**
	(0.6)	(0.65)	(0.62)	(0.65)	(0.640)	(0.65)	(0.7)
Financial crisis	2.15	1.98	2.96	1.99	2.18	2.15	1.7
	(2.29)	(2.27)	(2.36)	(2.29)	(2.29)	(2.3)	(2.53)
Lnassets	-0.01	-0.08	-0.02	-0.02	-0.01	-0.09	-0.41
	(0.87)	(0.87)	(0.8)	(0.86)	(0.86)	(0.86)	(0.9)
Lnfirmage	-0.045	-0.13	-0.2	-0.15	-0.32	-0.2	-0.07
	(0.81)	(0.82)	(0.83)	(0.82)	(0.84)	(0.83)	(0.92)
MA	-20.5***						
	(4.89)						
MSc		-7.109					
		(5.37)					
MBA			-10.29**				
			(4.26)				
PhD				-7.9			
				(6.37)			
JD					-21.27***		
					(4.43)		
MD						-20.21***	
						(5.633)	
Prof. Qual							-54.04***
							(5.42)
N	1.129	1.129	1.129	1.129	1.129	1.129	1.129
Pseudo-R^2	0.21	0.22	0.17	0.32	0.13	0.33	0.1

Table 11: Heckman two stage model Master qualifications

The table presents the results of Heckman Two stage method for CEO qualifications. Panel A presents the results at the graduate level of education. Panel B presents the results at the Doctoral Level of Education in which we also include any professional qualifications held by the CEO. In this two stage procedure the first stage selection equation is estimated by a probit regression from which the Inverse Mills Ratio is estimated. This ratio is then added to the second stage equation which controls for the presence of selection bias in the sample.

Panel A: Heckman two stage model for different types of Master qualifications

	M.A		MSc		MBA	
VARIABLES	Selection	Outcome	Selection	Outcome	Selection	Outcome
Constant	13.23	-2.51***	-38.11*	-2.4***	-25.17*	-1.3***
	(14.24)	(0.37)	(20.6)	(0.2)	(15.09)	(0.2)
Years of educ.		0.15***		0.16***		0.12***
		(0.02)		(0.01)		(0.01)
NYSE listing	7.6	-0.12	2.3	0.16	-3.3	0.3***
	(5.4)	(0.1)	(7.4)	(0.14)	(4.9)	(0.1)
Market condition	-1.01	-0.28*	6.7	0.15	6.71*	-0.08
	(4.2)	(0.1)	(7.2)	(0.1)	(3.8)	(0.09)
Earnings per share	-0.88	0.1	5.2	0.18	5.8	0.13
	(7.1)	(0.1)	(6.4)	(0.1)	(3.9)	(0.09)
Return on assets	8.2	0.12	0.3	0.08	-0.48	0.005
	(7.6)	(0.1)	(6.7)	(0.07)	(1.5)	(0.01)
Leverage	2.36	0.06	-0.91	0.01	-0.46	0.008
	(2.4)	(0.05)	(2.4)	(0.04)	(1.4)	(0.02)
Venture capital	3.49	-0.25	13.9**	0.15	4.84	-0.009
	(4.5)	(0.1)	(6.9)	(0.1)	(4.4)	(0.1)
Dot.com firm	5.14	-0.32	35.18***	0.07	27.71***	-0.112
	(8.13)	(0.26)	(7.6)	(0.14)	(5.4)	(0.12)
Tech. firm	9.26	-0.09	-3.9	0.1	8.14	0.14
	(8.73)	(0.3)	(10.06)	(0.17)	(6.1)	(0.1)
Regulated ind.	-1.24	-0.03	14.89**	0.48***	8.26**	0.09
	(4.4)	(0.16)	(6.3)	(0.1)	(3.7)	(0.09)
Underwriter	-7.2	0.08	3.8	0.14	0.72	-0.079
	(6.4)	(0.1)	(7.02)	(0.12)	(4.04)	(0.09)
Overhang	-1.15	0.005	4.6***	0.007	0.54	-0.005
	(0.7)	(0.01)	(1.09)	(0.01)	(0.3)	(0.01)
Financial crisis	10.97*	-0.02	-4.02	-0.09	10.07**	0.22*
	(5.6)	(0.21)	(8.2)	(0.1)	(5.02)	(0.11)
Lnassets	0.66	-0.03	1.31	-0.08**	0.88	-0.0009
	(1.5)	(0.05)	(2.13)	(0.03)	(1.1)	(0.02)
Lnfirmage	-2.33	0.04	-2.08	0.006	0.76	-0.02
	(2.8)	(0.08)	(3.72)	(0.05)	(1.7)	(0.04)
Inv. Mills ratio		-0.86		6.2		13.21
		(4.8)		(9.4)		(11.6)
N		1.129		1.129		1.129
Pseudo-R^2		0.12		0.16		0.07

Panel B: Heckman two stage model for different types of doctoral and professional qualifications

	PhD		J.D		M.D		Prof Qual.	
VARIABLES	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome
Constant	-36.57	-3.8***	-25.38	-2.25***	-31.1	-2.6***	-1.8	-1.81***
	(33.31)	(0.40)	(16.53)	(0.34)	(29.83)	(0.48)	(20.35)	(0.33)
Years of educ		0.35***		0.15***		0.25***		0.07***
		(0.02)		(0.02)		(0.03)		(0.02)
NYSE listing	16.75	-0.71***	1.79	0.02	3.2	0.03	-7.28*	0.13
	(21.27)	(0.24)	(5.2)	(0.19)	(20.71)	(0.3)	(4.17)	(0.2)
Market cond.	2.07	-0.02	12.39***	0.08	12.45	0.11	-0.43	-0.2
	(12.9)	(0.16)	(3.93)	(0.16)	(9.37)	(0.24)	(3.89)	(0.14)
Earn. per share	-2.48	-0.001	-1.5	-0.02	-19.53	-0.5*	6.32	0.02
	(13.2)	(0.17)	(3.43)	(0.16)	(15.15)	(0.28)	(4.4)	(0.17)
Ret. on assets	-0.62	-0.001	0.67	-0.001	-6.41	0.07	16.38	0.64**
	(3.36)	(0.01)	(1.09)	(0.01)	(7.73)	(0.1)	(11.94)	(0.32)
Leverage	1.72	-0.03	-1.19	-0.01	0.01	-0.004	-0.78	0.12*
	(3.84)	(0.04)	(1.1)	(0.01)	(1.8)	(0.05)	(1.85)	(0.07)
Venture capital	10.92	0.46***	-0.29	-0.55***	-2.09	0.39	11.02**	-0.1
	(14.91)	(0.17)	(6.76)	(0.18)	(10.01)	(0.24)	(4.39)	(0.17)
Dot.com firm	60.46***	-0.04	-1.46	-0.21	19.38**	-0.39	-7.78	-0.4
	(13.59)	(0.19)	(5.78)	(0.23)	(9.25)	(0.26)	(9.8)	(0.31)
Tech. firm	6.7	-0.49*	3.4	0.53**	45.38**	-0.27	11.51	-0.03
	(22.75)	(0.28)	(6.5)	(0.25)	(19.33)	(0.37)	(7.6)	(0.3)
Regulated ind.	37.61***	-0.46***	4.73	0.25	-3.98	-0.56**	-8.6**	0.06
	(12.41)	(0.16)	(3.95)	(0.15)	(9.9)	(0.23)	(3.6)	(0.15)
Underwriter	-3.63	0.08	9.03**	-0.05	-12.3*	-0.27	-4.2	-0.3*
	(11.48)	(0.16)	(4.25)	(0.17)	(7.37)	(0.21)	(4.6)	(0.16)
Overhang	1.07	0.024**	-0.47	-0.04	-2.16	-0.001	-1.3	-0.13***
	(0.82)	(0.01)	(0.7)	(0.03)	(1.4)	(0.02)	(1.5)	(0.04)
Financial crisis	15.02	-0.02	-5.41	0.06	23.74**	-0.02	1.813	0.01
	(15.48)	(0.21)	(4.4)	(0.2)	(9.6)	(0.28)	(4.2)	(0.19)
Lnassets	2.63	-0.01	0.14	-0.001	8.63*	-0.13*	0.89	0.07
	(4.24)	(0.05)	(0.85)	(0.04)	(4.9)	(0.07)	(1.3)	(0.04)
Lnfirmage	0.56	0.03	1.12	-0.1	3.3	-0.12	0.7	0.01
	(7.88)	(0.08)	(1.48)	(0.07)	(7.6)	(0.13)	(1.3)	(0.06)
Inv. Mills ratio		5.7		8.9		3.6		5.148
		(8.5)		(7.9)		(5.3)		(10.15)
N		1.129		1.129		1.129		1.129
Pseudo-R^2		0.4		0.12		0.4		0.1

Table 12: Industry effects specification analysis

The table presents output of industry effects analysis on the relation of CEO graduate and professional qualifications on underpricing. Results are estimated with treatment effect models for each individual attainment with heteroscedasticity robust standard errors. Dummy variables for eleven industry classifications are included each specification model.

VARIABLES	(T.E.) MA	(T.E.) MSc	(T.E.) MBA	(T.E.) PhD	(T.E.) JD	(T.E.) MD	(T.E.) Prof Qual
Cons prod & serv	13.46*	12.31	12.27	11.85	12.13	12	9.1
	(8.12)	(8.16)	(8.17)	(8.11)	(8.16)	(8.17)	(6.2)
Consumer staples	15.35*	14.9*	15.14*	14.32	14.55*	14.55*	9.1
	(8.8)	(8.7)	(8.8)	(8.82)	(8.8)	(8.8)	(6.6)
Energy and power	3.59	3.18	3.4	2.52	3.62	2.96	0.8
	(7.41)	(7.41)	(7.4)	(7.38)	(7.42)	(7.42)	(6.14)
Financials	7.05	6.84	6.9	6.37	7.16	6.65	4.03
	(7.09)	(7.08)	(7.1)	(7.04)	(7.1)	(7.1)	(5.79)
Healthcare	-6.6	-7.12	-6.8	-8.14	-7.11	-7.3	-9.16
	(7.07)	(7.06)	(7.04)	(7.03)	(7.04)	(7.1)	(6.3)
High tech.	6.5	6.71	6.93	6.17	6.61	6.48	6.41
	(7.3)	(7.33)	(7.3)	(7.26)	(7.3)	(7.32)	(5.7)
Industrials	11.25	10.85	11.12	10.39	10.8	10.6	6.51
	(8.6)	(8.63)	(8.6)	(8.55)	(8.6)	(8.6)	(6.4)
Materials	1.52	1.12	1.53	0.42	0.95	0.86	-2.8
	(7.67)	(7.66)	(7.68)	(7.63)	(7.64)	(7.66)	(6.58)
Media and entert	6.52	6.36	6.42	6.04	6.17	6.03	7.2
	(9.03)	(9.05)	(9.07)	(9.02)	(9.1)	(9.06)	(7.2)
Real estate	-0.38	-1.29	-0.74	-1.37	0.03	-1.46	-5.72
	(6.91)	(6.88)	(6.87)	(6.83)	(6.91)	(6.9)	(6.46)
Retail	10.87	10.44	10.35	10.17	10.23	10.17	6.17
	(7.69)	(7.65)	(7.7)	(7.65)	(7.6)	(7.69)	(6.2)
Market cond.	5.9***	6.27***	5.87***	6.09***	6.25***	6.17***	7.39***
	(1.8)	(1.81)	(1.9)	(1.83)	(1.82)	(1.84)	(1.9)
Earm. per share	0.6	0.81	0.95	0.61	0.48	0.21	0.43
	(2.3)	(2.2)	(2.2)	(2.35)	(2.3)	(2.3)	(2.41)
Ret. on assets	0.01	0.01	0.01	0.01	0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Leverage	0.05	0.02	0.08	0.03	0.02	0.03	-0.04
	(0.41)	(0.39)	(0.39)	(0.4)	(0.41)	(0.41)	(0.42)
Venture capital	9.61***	9.9***	9.69***	9.68***	8.98***	10.12***	10.18***
	(3.06)	(3.05)	(3.03)	(3.03)	(3.07)	(3.06)	(3.08)
Dot.com firm	35.68***	35.7***	35.4***	35.47***	35.19***	35.46***	36.4***
	(5.223)	(5.27)	(5.2)	(5.21)	(5.19)	(5.23)	(5.33)
Regulated ind.	7.7***	8.04***	7.6***	7.46***	7.88***	6.92***	5.48**
	(2.4)	(2.5)	(2.5)	(2.5)	(2.5)	(2.47)	(2.74)
Overhang	1.41**	1.39**	1.38**	1.37**	1.36**	1.39**	1.52**
	(0.64)	(0.63)	(0.6)	(0.62)	(0.62)	(0.62)	(0.67)
Financial crisis	2.12	2.04	2.79	2.04	2.2	2.1	1.75
	(2.17)	(2.16)	(2.21)	(2.16)	(2.18)	(2.19)	(2.47)
Lnassets	-0.19	-0.21	-0.11	-0.17	-0.21	-0.25	-0.56
	(0.89)	(0.89)	(0.88)	(0.88)	(0.89)	(0.8)	(0.9)
Lnfirmage	-0.8	-0.92	-0.97	-0.92	-1.01	-0.95	-0.8
	(0.89)	(0.9)	(0.91)	(0.89)	(0.91)	(0.9)	(0.99)
MA	-16.23***						
	(5.13)						
MSc		-5.41					
		(5.51)					
MBA			-7.71*				
			(4.03)				
PhD				0.67			
				(6.4)			
JD					-19.16***		
					(4.89)		
MD						-10.55**	
						(5.371)	
Prof Qual.							-54.91***
							(5.1)
N	1.129	1.129	1.129	1.129	1.129	1.129	1.129
Pseudo-R^2	0.13	0.16	0.1	0.4	0.13	0.4	0.1

Table 13: Treatment effects model on raw initial returns

The table presents regression output on CEO attainments and underpricing. Each graduate and professional qualification is regressed on the level of Raw Initial returns. The estimation method is the treatment effects with heteroscedasticity robust standard errors. The sample consists of 1.129 IPOs that floated US stock exchanges from the the 1st of January 2000 to the 30th of June 2013. We relied on the Securities Data Company (SDC) Database to retrive information on IPO deals. Accounting data were collected from CRSP and Compustat databases. Data on CEO educational background were hand-collected from BORDEX.

Variables	(T.E.) MA	(T.E.) MSc	(T.E.) MBA	(T.E.) PhD	(T.E.) JD	(T.E.) MD	(T.E) Prof. Qual
NYSE listing	-0.19*	-0.18	-0.03	-0.22*	-0.17	-0.19*	-0.16
	(0.12)	(0.12)	(0.13)	(0.12)	(0.12)	(0.1)	(0.12)
Market cond.	0.86***	0.93***	0.88***	0.86***	0.9***	0.91***	0.86***
	(0.1)	(0.1)	(0.1)	(0.11)	(0.1)	(0.1)	(0.11)
Earn. per share	0.32***	0.31***	0.34***	0.24**	0.26**	0.24**	0.33***
	(0.1)	(0.1)	(0.11)	(0.1)	(0.11)	(0.1)	(0.11)
Ret. on assets	0.01	0.01	0.01	0.03	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.05)	(0.01)	(0.01)	(0.01)
Leverage	-0.01	-0.01	0.01	0.02	-0.01	-0.01	-0.01
	(0.02)	(0.02)	(0.03)	(0.05)	(0.02)	(0.02)	(0.03)
Venture capital	0.49***	0.52***	0.51***	0.38***	0.39***	0.53***	0.46***
	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)	(0.11)	(0.12)
Dot.com firm	0.68***	0.73***	0.7***	0.82***	0.68***	0.7***	0.65***
	(0.13)	(0.13)	(0.14)	(0.16)	(0.14)	(0.13)	(0.14)
Tech.firm	-0.48***	-0.44***	-0.41**	-0.5***	-0.36**	-0.52***	-0.46***
	(0.16)	(0.16)	(0.17)	(0.19)	(0.17)	(0.16)	(0.17)
Regulated	0.32***	0.37***	0.33***	0.28**	0.4***	0.24**	0.35***
	(0.1)	(0.1)	(0.1)	(0.11)	(0.1)	(0.1)	(0.2)
Underwriter	0.19*	0.22**	0.16	0.2*	0.2*	0.18*	0.11
	(0.11)	(0.1)	(0.11)	(0.12)	(0.1)	(0.1)	(0.11)
Overhang	0.04***	0.04***	0.038***	0.04**	0.03***	0.047***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial crisis	0.45***	0.45***	0.57***	0.51***	0.48***	0.47***	0.42***
	(0.14)	(0.14)	(0.15)	(0.16)	(0.14)	(0.14)	(0.15)
Lnassets	-0.04	-0.03	-0.04	-0.04	-0.03	-0.04	-0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Lnfirmage	0.17***	0.16***	0.15***	0.19***	0.15***	0.16***	0.16***
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)
MA	-1.64**						
	(0.6)						
MSc		-0.61					
		(0.39)					
MBA			-1.25***				
			(0.37)				
PhD				-0.53			
				(0.42)			
JD					-2.86***		
					(0.4)		
MD						-1.33***	
						(0.34)	
Prof. Qual.							-2.18***
							(0.24)
N	1.129	1.129	1.129	1.129	1.129	1.129	1.129
Pseudo-R^2	0.16	0.16	0.07	0.06	0.13	0.4	0.11

Chapter 4 - Do Multiple Credit Ratings Facilitate the Going Public Process?

4.1 Introduction

On October 2010 with less than thirty days remaining to its scheduled initial public offering (IPO), General Motors Co. (GM) was escalating efforts to settle a filling price range for the upcoming issue. Noticeably, during this busy time period the company announced multiple rating acquisitions from the world's three most prestigious credit rating agencies (CRAs). In particular, Moody's assigned GM a rating of Ba2 while both Standard & Poor's and Fitch awarded the firm BB- ratings. One month later, at new issue day, the global financial press was focusing on one of the biggest IPOs in American history. The company managed to raise an astonishing $20.1 billion and also incurred a modest underpricing of 3% in a year where the average amount of 'money left on the table' was 8.7%. Interestingly, this remarkable achievement comes from a corporation that was bailed out by the U.S. federal government after filing for Chapter 11 bankruptcy protection in 2009. Naturally, one could question whether the possession of ratings from various CRAs is at least partly related to an IPO's superior short run performance. This consideration entails valuable implications for the international investor community in the years following the credit crunch of 2007 where a series of corporate failures initiated severe criticism on the role and validity of CRAs' evaluations.

While the catalogue of rated prospective issuers goes on, the accounting and corporate finance literature has to draw the line to first trading day performance. Taking into account a plethora of studies supporting the dissemination of information or uncertainty reduction to the advantage of the least informed parties in an IPO deal (e.g. Rock, (1986); Beatty and Ritter, (1986); Benveniste and Spindt, (1989); Welch, (1992); Habib and Ljungqvist, (2001); Lowry and Shu, (2002), Loughran and Ritter, (2002) and Liu and Malatesta, (2006)) it is startling that the acquisitions of ratings from various CRAs, as a means of the company to communicate advanced quality status, remains a mainly unexplored area. The present paper investigates the impact of securing multiple credit ratings on a firm's IPO endeavor by asking questions in the interest of outside market players. Does the costly decision to acquire ratings influence the level of initial returns in the first place? Do credit ratings from a certain CRA affect IPO pricing more

than those from others? Are acquisitions of multiple credit ratings valuable? Are there important differences among various combinations of multiple ratings on the reduction of underpricing? Is it worth it to maintain evaluations from all the three leading U.S. CRAs from an IPO perspective? Is the combined level of rating from multiple CRAs associated with less money left on the table? Finally, does a compound rating environment facilitate the book-building process via lowering the range of filing price revisions?

In an important deviation from prior studies that scrutinize potential gains accruing to rated corporations seeking to smooth the progress of capital raising in debt markets (e.g. Ederington and Yawitz, (1987); Benabou and Laroque, (1992); Ederington and Goh, (1998); Boot et al, (2006); Skreta and Velkamp, (2009); Guntay and Hackbarth, (2010) and Bolton, Freixas and Shapiro, (2012)), we explore the effectiveness of new issuers to lessen the inherently uncertain environment of the going public process by attaining evaluations from world's leading CRAs. We content that the existence of independent assessments from trained experts of rating agencies within a reasonably short time period ahead of the floatation day, provide an effective way to communicate valuable information to outside market participants. As it is easily traceable and also publicly available, a record of credit rating acquisitions can effectively enhance an entity's increased risk bearing capacity. Consequently, future investors of a new listing are more confident that the company will face fewer market frictions and thus require lower premia in order to procure its equity. On this basis, the IPO firm can initiate operations as a public entity by leaving only a modest amount of money on the table.

Motivated by the insufficient and occasionally conflicting empirical evidence on this issue, we address the above questions and shed light to the role of multiple credit ratings as contributors to the success of new listed entities. In our analysis, we employ a comprehensive and large sample of U.S. initial offerings covering a period that spans from the 1st of January 1997 to the 31th of December 2014. Based on information retrieved from the Bloomberg database we manually inspect each individual corporation for evidence of acquisition of credit ratings up until its first trading day. This way we amass our special interest sample of firms that sought evaluations form various CRAs. Contrasting the average underpricing of 18% of rated issuers with the rest of IPO's mean initial returns of 27% we present strong preliminary findings for our conjectured impact of credit ratings on first trading day performance. Interestingly, appraising the

fundamentals of rated IPOs we discover that these issues relate to better quality proxied by the extent of operational experience (measured in years), market share, and the amount of proceeds raised. Therefore, it becomes reasonable that rated companies engage in the costly investment of rating acquisition in an effort to handle in time market frictions and uncertainties that lay ahead.

Our empirical analysis reveals that top-management's decision to seek CRA evaluations turn out to be visible by potential IPO investors and contributes to a successful first trading day. Utilizing the total sample of new listings, we regress the level of initial returns on the corporation's choice to obtain ratings from various agencies, along with a set of control variables that are commonly employed in relevant literature. Findings, verify the inverse relation between the existence of any credit rating (from the three largest U.S. agencies) and underpricing. The same is true for all possible dual combinations among CRAs. Specifically, after testing that Standard & Poor's, Moody's and Fitch individually reduce money left on the table, we create an array of categorical variables that equal to unity for corporations that secure ratings from any two of the aforementioned CRAs and zero otherwise. All coefficients are consistently negative and strongly significant. Additionally, it is fairly interesting that this conclusion holds even for triple rated entities.

Methodologically, we place special emphasis on the above analysis to depict inferences not crippled by endogeneity. Given that firms' high ranked executives choose to attain credit ratings after deciding that potential gains from such an investment could exceed the cost required by CRAs, we are induced to recognize that self selection is present in our empirical approach. In an IPO context, the benefits associated to the possession of ratings link to uncertainty mitigation which burdens the uninformed outsiders. Econometrically, this rationale implies that company specific characteristics impelling the decision to seek CRAs' evaluations also affect the level of initial returns. To effectively deal with feedback effects we instrument for the choice to obtain credit ratings with an array of rating determinants which are established in relevant literature and are specially modified to the IPO framework. Then we determine the selection as well as the outcome equations following a two step process that constitutes both the Heckman and the generated instrumental variables (IV) method. The first methodology tackles self selection bias arising from the corporation's will to create a credit rating record. The IV approach enhances the robustness of the chosen rating determinants

included in the first stage regression by instrumenting with fitted values. We present both models next to the output of the standard OLS estimations. Perpetually, all three procedures verify the soundness of our results.

With our major supposition validated we turn our focus from credit rating existence per se to the levels of ratings. We draw information from the Bloomberg database and assign incremental numerical values to each awarded rating from all three agencies. Thus, the rating scale ranges from 22 to 0 for each CRA with 22 corresponding to the highest possible rating (AAA for Standard & Poor's and Fitch and Aaa for Moody's) and 0 to lowest default grade (D for Standard & Poor's and Fitch and C for Moody's). Regressing these ordered estimators on initial returns we reveal a strong (and positive) association between higher rating levels and distinguished short run IPO performance. The results hold for all individual agencies and also when they collectively tested against underpicing. We justify the robustness of this inference by relying on both OLS and the generated IV approach. Based on this evidence we deduct the conclusion that increased risk bearing capacity as reflected by the assigned rating level is a essential contributor of uncertainty contraction.

Further, we scrutinize a short time period before the actual IPO day to present supplementary support for the role of CRAs as valuable disseminators of information, stemming from the book building process. Based on both the extent and direction of the revisions of the filing price we investigate how establishing a credit rating record facilitates price discovery. Clearly, it methodically guides the IPO offer price to be revised downwards. This association along with the considerably lower underpricing confirms the highballing of rated offerings; a situation that can only be substituted by feedback provided from informed investors. In this environment, the underwriter seems to abstain from the excess amount of cash generated in the going public process to the benefit of the issuer with no obvious incentive to do so. Stimulated from this repetitive pricing evidence we claim that acquisitions of credit ratings can be an important source of information both for the underwriters as well as the new listing investors.

We place our empirical findings in a series of robustness exercises. First, we assess the impact of investment grade ratings on the level of initial returns by constructing a matched sample of IPOs. In particular, firms that obtain ratings equal to or above the BBB- level for Standard & Poor's and Fitch and Baa3 for Moody's are tested against the

money left on the table by rated firms only. If our conjecture that more positive evaluations on the company's credit quality associate to superior first trading day performance is true, then investment grades should also be strongly and negatively related to underpricing. Second, in order to extra examine the role of CRAs as disseminators of information to outsiders, we employ as alternative dependent variable the Tobin's Q ratio that comprises an effective proxy of an enterprise's competitive advantage (refer to Chung and Pruitt, 1995) via its ability to reflect the projected cash inflows after the implementation of a strategic decision (such as the acquisition of credit ratings). Thirdly, following Certo et al (2003), we explore the effect of CRA assessments on investor valuations for rated IPOs. Essentially, this estimator surrogates prices that market participants assign to our special sample of interest. At last, an additional set of auxiliary tests that appraise both time and size sensitivity of our results takes place. Invariably, all of the above instances qualitatively align with our main research hypotheses.

This paper makes important contributions to corporate finance and IPO literature while it deals with concerns of wider public interest such as the weight of CRA evaluations to equity markets and the institutional framework of the going public process. First, we illustrate how firms' credit rating record which generally associates to the risk bearing capacity of an organization, also translates to a direct and quantifiable gain on the new issue day. Acquisition of any combination of the three leading CRAs exert profound impact on alleviating IPO specific uncertainty since both potential investors and underwriters are found to value the firm's decision to secure ratings. Particularly, the former award the rated companies with modest underpricing and the latter allocate a premium valuation. Further, we assess the incremental effects of assigned rating levels on initial returns and we establish evidence that higher grades certainly augment the strength of disseminated information to outsiders about the new offering's quality. Additionally, by turning our attention not only to the actual IPO day but also to the short pre-listing period in which the price discovery process takes place we justify the facilitating role of CRAs in the book building mechanism. Lastly, in robustness check setting the investment character of credit rating attainment is evident both by its impact on Tobin's Q ratio and on investor valuations. Thus, the inference for potential issuers is unequivocal; even though it is an expensive decision to get hold of ratings from prestigious agencies the company sets aside more money on the first day of trade.

This study relates to the research of Beatty and Ritter (1986), Megginson and Weiss (1991), Loughran and Ritter (2002), Certo (2003), Boot et al. (2006) Liu and Malatesta (2006), An and Chan (2008), Sokobin and Spatt (2009), Guntay and Hackbarth (2010), Bolton, Freixas and Shapiro (2012). Central concern in the literature of IPOs is the endeavor of issuers to contest adverse selection apprehensions by disseminating information that reveal the firm's superior quality. On this basis, corporations rely on an assortment of mechanisms well established in corporate finance. A comprehensive catalog of studies demonstrates issuers' aim to extract prestige spillovers via: a) appointing renowned auditors (Beatty and Ritter, 1986), b) appealing to venture capitalists with a verified trace of successful initial offerings (Megginson and Weiss, 1991), c) entrusting top-ranked underwriters (Loughran and Ritter, 2002), and introducing high-status executives to the company's top management (Certo, 2003). Interestingly, very few studies are found to supplement this notion by focusing on the role of credit rating as proxy of firm value. Liu and Malatesta (2006) were the first to support the facilitating role of CRAs in an SEO context while An and Chan (2008) exclusively focus on Standard & Poor's ratings for a sample of US IPO deals. We expand this literature by producing the first study which investigates compound credit rating activity as strategy of communicating the quality of the upcoming offering. An additional stream of literature (Sokobin and Spatt, (2009); Guntay and Hackbarth, (2010); Bolton, Freixas and Shapiro, (2012)) focuses on the association of ratings with firm performance with evidence stemming only from listed companies. From an alternative perspective, our study asserts corporations' necessity to set up a record of CRA evaluations prior to the IPO in order to cash benefits at the first trading day.

The rest of this study obtains the following structure: Section I reviews relevant papers in IPO and credit rating literature. Section II builds up our research hypotheses. Section III identifies the sources of data collection and describes the sample. Section IV delineates the employed methodology. We present the empirical analysis in Section V. The robustness of our findings is tested in Section VI and lastly section VII offers the conclusion of the paper.

4.2 Related Literature

4.2.1 Theoretical Framework

Price determination of new equity issues takes place in an uncertain environment. Relevant research on this topic consistently relies on listing day performance to measure uncertainty. Since Stoll and Curley (1970), Logue (1973) and Ibbotson (1975) established initial evidence on persistent abnormal returns for investors, numerous studies attempted to set light to the puzzle of initial returns or IPO underpricing. Recognition of asymmetric information between the various equity market players comprises the central point for the majority of available explanations. On this ground, Rock (1986), as well as Beatty and Ritter (1986), propose that outsiders consider themselves insufficiently informed about the firm prospects and demand price discounts. Simultaneously, the book building process requires unbiased opinions of engaged investors which are also costly. To cover up for this, underwriters need to lower the offer price (Benveniste and Spindt, (1989); Benveniste and Wilhelm, (1990); Spatt and Srivastava, (1991)).

An alternative explanation which also arises from the concept of asymmetric information attributes value to underpicing and claims that issuers intentionally consent to it. Specifically, Welch (1992), Habib and Ljungqvist (2001) and Demers Lewellen (2003) argue that a low offer price essentially serves as marketing strategy aiming to make the new offering attractive to investors. This way the firm will recover the money left on the table at the first trading day. Chemmanur (1993) adds to literature that management allows for high initial returns in order to buy analyst coverage while other studies (Hughes and Thakor (1992), Drake and Vetsuypens (1993), Lowry and Shu (2002)) highlight the importance of a strong first day close on lawsuit avoidance.

Finally, shifting perspective from asymmetric information to prospect theory we get an additional interesting insight. Loughran and Ritter (2002) content that issuers being in a euphoric state from the new wealth created by the IPO sale can willingly overlook the cost of underpricing. However, as Jay Ritter mentions in his website, the total amount of money left on the table worldwide is $763.53 billion over the last thirty three years. Thus, any behavioral approach seeking to diminish the importance of effective IPO pricing should be evaluated with skepticism.

4.2.2 Credit Rating Agencies as information transmitting mechanisms

The role of credit ratings as uncertainty reducing mechanisms to market players is well documented in the finance literature. The seminal work of Ederington and Yawitz (1987), reports that firm managers supply CRAs with proprietary information which is strictly concealed to outsiders. Thus, the later essentially serve as information intermediaries whose purpose is to alert investors on the company's prospects without revealing confidential documents and data. Benabou and Laroque (1992), explain that this process is directly analogous to the situation analysts have to deal with when they are asked to suggest stocks to the general public.

Securing a favorable evaluation is of vital importance for the firm's prestige considering that ratings not only provide independent assessment of an organization's creditworthiness but also implicitly assume supervisory role for top management. As Pagano and Volpin (2010), point out, CRAs employ watchlist mechanisms in order to influence directors to undertake risk alleviating courses of action with the threat of grade reduction. Inability to comply with these requirements and a subsequent downgrade can exert negative impact on investor confidence. On this basis, Hand et al (1992), examine the monitoring methods of Standard and Poor's and Moody's and confirm that adverse announcements on rating levels lead to a strong and immediate stock price decline. Ederington and Goh (1998), go one step further to clarify that this equity loss is attributable only to the worsening of the company's credit bearing ability and not to any other cause such as lower current earnings. Boot et al (2006), also enrich the extant literature with the notion that since a sufficient amount of investors base their investment decisions on CRAs, other less informed market participants will follow reaching an optimal equilibrium in an environment where information asymmetries dominate.

Even though the aforementioned studies augment the role of CRAs as effectual proxies of firm quality, spectacular corporate failures of companies with very high ratings and the recent subprime mortgage crisis, induce skepticism on objectivity and the validity of CRAs' evaluations. In fact, the three leading US rating agencies were severely criticized for misleading investors. The US House Representative, Jacqueline Speier , reveals the magnitude of pressure put on CRAs as she questions Moody's top management in a 2009 congressional hearing:

‘’*You rated AIG and Lehman Brothers as AAA, AA moments before their collapse. Did you take any actions against those who put that kind of a remarkable grade on products that were junk?*’’

On this ground, Bolton, Freixas and Shapiro (2012), report that disbelief towards the credit rating system rest on the idea that the major source of revenue for CRAs comes from firms that are under evaluation. Additionally, they mention that in the oligopolistic market of rating agencies, companies with just a single rating are more appealing to investors compare to organizations with two or more ratings. The explanation for this lies on the so called ‘’rating shopping’’ hypothesis in which the issuer asks multiple agencies for evaluation but eventually seeks to deceive naïve investors by purchasing only the most favorable one (Poon and Firth (2005), Skreta and Velkamp (2009), Sangiori, Sokobin and Spatt (2009)). Bogaerts et al (2012), strengthen this argument suggesting that demand for additional ratings is more useful for regulatory processes than for information production purposes.

On the other hand, Guntay and Hackbarth (2010), confute detractors of CRAs by claiming that multiple ratings are inversely related to asymmetric information in the minds of risk averse investors. Similarly, Morgan and Stocken (2003), establish a model that quantifies the reputational cost incurred by lying certifiers and conclude that this is too high for rating agencies and thus should be avoided under any circumstances. Lastly, we should mention that the ramifications of CRAs’ evaluations are vital not only for the debt but also for the equity markets. Liu and Malatesta (2006), argue that rated seasoned equity offerings endure significantly lower underpricing than the unrated once. While, An and Chan (2008), maintain that the same is true for the IPO firms with Standard & Poor’s ratings.

Overall, literature on the role of CRAs as information transmitting mechanisms is inconclusive and raises doubts on their presumed ability to mitigate uncertainty. Especially, in equity markets no previous study has attempted to assess how the acquisition of multiple ratings affects the going public process.

4.3 Hypothesis Development

Since the influential research of Spence (1973) that was the first to present evidence on the importance of disseminating appropriate information to eliminate labor market inefficiencies, finance and accounting literature relies heavily on uncertainty contraction mechanisms. In this regard, Ross (1977) suggests that corporations of superior quality can distinguish themselves by expanding their total amount of leverage which is not an option for competitors with high default probability. Along this line of reasoning, Bhattacharya (1979) mentions that dividend issuance signifies to outsiders the prospect of increased expected cash flows. According to Certo (2003), both of these financial strategies qualify as effective investing decisions as they are easily identifiable by market participants and also costly to imitate by rival firms.

The going public process is in its own right an environment dominated by information asymmetries where justification of certain courses of action supporting the enterprise's quality can determine the success of the initial offering. To this end newly listed corporations entrust top-tier underwriters (Carter et al, (1998)), prestigious auditors (Gompers & Learner, (2004)) and reputable auditors (Chemmanur & Paeglis (2005)) in an effort to communicate their advanced financial standing.

While research on how the various types of uncertainty reducing mechanisms affect IPO performance goes on, up till now, the firm's decision to obtain one or multiple credit ratings before the new issue day; remains a relatively unexplored area. Addressing this concern, our paper contents that acquisition of multiple ratings from the world's leading CRA's (Standard & Poor's, Moody's and Fitch) in the pre-IPO period, should mitigate uncertainty by influencing market participants to follow the assessment of the agencies. According to Ritter and Welch (2002): '' all theories of underpricing based on asymmetric information share the prediction that underpricing is positively related to the degree of asymmetric information'' we argue that independent evaluation of the company's prospects by world-known and reliable experts could also reduce the amount of money left on the table.

Additionally, following the intuition of Chemmanur and Paeglis (2005) who propose that superior quality managers seek ways to communicate the company's intrinsic value by ''lowering heterogeneity in investor valuations'' we argue that securing one or more ratings enhances significantly outsiders' trust on the firm

H.1. Ceteris Paribus, firms that obtain one or multiple ratings experience lower initial returns compare to non-graded ones.

If our initial supposition holds, the next step in our analysis is to investigate whether the impact on the magnitude of underpricing varies across rating levels of the three agencies. We content that CRAs not only inform market participants on the company's risk profile but also provide monitoring services via the so called ''watch procedures'' which can also serve as effective uncertainty eliminators. According to Boot and Milbourn (2002), CRAs strike an implicit ''deal'' with firm managers where the later agree to proceed to corrective actions, when it is necessary, in order to avoid reduction of credit level. Failure to achieve this target and a consequent downgrade can challenge the confidence of investors and undermine the corporation's prospects.

H.2. Ceteris Paribus, increments in the firm's credit rating level, of any rating agency, are negatively related to the level of underpricing.

Securing one or multiple ratings could also serve as a valuable apparatus for investment bankers. Specifically, as the book building process takes place, underwriters promote the new offering during the road show and attempt to extract proprietary information by informed investors (Benveniste and Spndt, 1989 and Hanley, 1993) in order to facilitate the price discovery mechanism. The magnitude of price revisions is analogous to the released information by this procedure. On this basis, we content that less information is required for firms which have already been evaluated by rating agencies for their risk profile and creditworthiness. Especially, the presence of multiple ratings reveals a wider consensus on the firm's financial standing and mitigates informational asymmetries.

H.3. Ceteris Paribus, the existence of one or more credit ratings lowers the degree of price revision.

4.4 Data and Sample

4.4.1 Sample selection criteria for US initial offerings

To construct our sample we rely on information collected from the Securities Data Company (SDC) database which covers the full population of new listings that floated the US stock exchanges from the 1st of January, 1997 to the 31th of December, 2014. Following the extant relevant literature (e.g. Ritter and Welch (2002), Loughran and Ritter (2002), Ljungqvist and Wihelm (2003), and Lowry and Schwert (2004)) we exclude those initial offerings bearing a share price less than $5, ADRs, reverse LBOs, limited partnerships and also foreign issuers of shares that are already trading in local markets. Additionally, although we permit financial companies to enter our sample, we are particularly careful not to incorporate REITs, closed end funds, special purpose investment vehicles and royalty trusts. On this basis, we do not take into account firms with standard industry classification codes between 6723 and 6999 plus enterprises that even though sidestep Thompson Reuters restrictions for closed end funds, they continue to function as such. Further, we rule out corporate spin offs as they are part of mature and considerably large businesses and so entail lower underpricing than the average IPO. The rest of the sample is enriched with information from Compustat and the Center of Research in Security Prices (CRSP) which provide us with IPO companies' accounting variables and after market performance respectively. This way we reach a final sample of 2,541 exclusive US IPOs.

4.4.2 Credit rating agency identification

The choice to secure credit ratings comprises the major available avenue for corporations to acquire an independent evaluation of their risk bearing capacity by well known agents. The decision to engage in such a strategic investment requires significant costs and is made by the firm's top-ranked executives. In our study, we investigate whether this expensive acquisition of any particular rating or combination of ratings from various CRAs (by private firms) facilitates the going public process. To this end, we rely on information retrieved from the Bloomberg database for our selected sample and we identify a sum of 252 awarded ratings to corporations at least one year prior to the offering.

Even though we could possibly limit our analysis on the relation of any credit rating possession with short run IPO performance, we do recognize that variations among CRAs' assessments are evident in financial markets. As suggested by Purcell, Brown, Chang and Damrau (1993), rating agencies adopt distinctive evaluation methods that result in the assignment of different default probabilities to the companies under examination. Thus, one could argue that in the context of new listings different rating philosophies across CRAs may disseminate dissimilar information to outside investors. For this reason we also use Bloomberg to associate each individual rating of a specific agency with its assigned rating level.

4.4.3 Sample identification and descriptive statistics

Table 1 (Panel A), offers a preliminary portrayal of our total sample (N=2,541) in comparison with sub-samples of enterprises with (N=252) and without (N=2289) acquisitions of credit ratings. The time span from the 1st of January, 1997 to the 31th of December 2014 includes IPO deals of companies that secured one or multiple ratings at least one year prior to the offering. This consortium illustrates interesting fluctuations in the number of awarded ratings. In particular, for the year 1998 data divulge a sufficient amount of rated firms (25) which is partly attributable to the record high new listing activity that begun with the 'dot.com' period that picked on March 2000 (Aggarwal, 2002).

The burst of this bubble at the end of 2000, coupled with major corporate failures and the subsequent economic slow-down of the U.S. economy, reduced the number of rated corporations almost by one-third in the next three years (9 ratings were identified in 2003). Then, rating acquisition increased again until the credit crunch of 2007-2008 (e.g. we report only one rated IPO deal in 2008). The CRA industry recovers the lost ground towards the end of our sample period (13 ratings in 2013). Hence, there is non-trivial verification that the frequency of credit rating possession by potential issuers strongly associates to the overall state of the economy.

Additionally, the right hand side of Panel A presents information on the allocation of ratings across years as well as the three leading U.S. CRAs under investigation. Consistently, we observe that the most preferred agency is Standard & Poor's with a total of 111 awarded evaluations, followed by Moody's with 86 and lastly by Fitch with 55. The three CRAs combined have given a rating to the 9.92% of the total sample. Panel B,

further analyzes the structure of credit ratings via exemplifying their assigned level. Interestingly, we notice that the bulk of rated companies range between the BBB+ and B- levels for Standard & Poor's and Fitch and between Baa1 and Ba3 for Moody's. Essentially, IPO deals concentrate around the boarder-line of lower medium investment grade and non investment speculative grades.

Table 2 supplies descriptive statistics for the complete sample as well as for the rated and nonrated new offerings. Appendix A contains detailed definitions of all the employed variables. Panel A puts forward four preliminary indications which support our main research hypothesis that rated firms incur less money left on the table. First, IPOs securing credit ratings document an average underpricing of a modest 18%. This results in an adequate 9 percentage point difference as opposed to the 27% first day return of their non rated counterparts. Second, repression of upward filling price revisions during the book-building process averts the need to bump up underpricing as a means of compensation to informed investors in order for them to unveil proprietary information (Hanley (1993), Loughran and Ritter (2002)). Therefore, in the credit rating sample exclusively, the average value of price revisions attains a minus sign (-2%). Third, Tobin's Q as an effective proxy of a company's competitive advantage (refer to Chung and Pruitt, 1995) also demonstrates inaugural evidence which sustain the notion that CRAs' evaluations positively relate to distinguished short run IPO performance. This is evident at the mean Tobin's Q ratio of rated new offerings which exceeds that of non rated issues by 27%. Lastly, the same conclusion holds true for our investor valuation estimator that appears 29% larger for firms that obtain credit ratings. Noticeably, the mean differences of all variables included in Panel A are statistically significant at the 5% and 1% level accordingly.

Panel B illustrates the IPO specific characteristics employed as control variables in all specification models. Proportionally, rated corporations are sufficiently larger than the non rated ones as surrogated by the mean of gross proceeds which amounts to almost $346 million raised by the former and $91 million by the latter IPO deals. This trend is also evident when average net sales are utilized as an alternative way to proxy for size while new listings with credit ratings take on less leverage.

On top of these stronger fundamentals, firms with credit ratings have longer time span of operations with an average age of about 26 years; which is almost 13 years older

than the average of the non rated sample. In line with their overall displayed quality, IPOs that maintain CRA evaluations usually rely on prestigious auditors and underwriters to facilitate the going public process and are not likely to seek venture capital backing. Additionally, they issue lower amount of primary shares while their presence is not eminent in NASDAQ which is a stock exchange that associates with more speculative listings (Lowry and Shu, 2002). Lastly, we observe no significant difference in the percent of shares overhang among new offerings with and without credit ratings.

4.5 Methodology

To fully capture the effects of credit ratings on IPO pricing we specify the following model:

$$Y_i = \alpha + \beta X_j + \gamma CR + \varepsilon \quad (1)$$

Where Y_i is the level of initial returns (or degree of price revision), X_j represents a vector of exogenous IPO relevant characteristics, CR enters the equation as a binary variable that is equal to unity when the firm secures one (or multiple) rating(s) and 'ε' stands for the disturbance term.

Initially, we conduct our analysis in a multivariate OLS regression setting. In order for coefficients to be unbiased, the estimate 'γ' of our main independent variable needs to be free from feedback effects and thus uncorrelated with 'ε' (Cov(CR,ε)=0). However, someone could argue that the acquisition of credit ratings is least partially decided by the firm's management. It is plausible to assume that any company will seek CRAs evaluations if benefits, namely expectation of superior first trading day performance, outweigh the price required by the rating agencies. In this case, endogeneity and self selection bias could produce unreliable results.

Heckman (1979) argues that endogenous selection is very similar in nature with the omitted variables problem and proposes a two stage procedure to cope with it. Following this process we define a first stage regression that estimates the probability of a firm securing a rating. Specifically, we model this selection equation as:

$CR_i^* = \omega W_i + \mu$ (2)

Where: $CR_i = \begin{cases} 1, \ if \ CR_i^* > 0 \\ 0, \ if \ CR_i^* \leq 0 \end{cases}$

In equation (2) CRi* is a latent variable, W a set of quantifiable determinants of CR, ω a vector of coefficients to be estimated and μ is the error term. Among the variables included in 'W' some could exert influence on IPO pricing and may be part of 'ε' in equation (1). Additionally, certain information that influence the company's choice to seek ratings like R&D plans cannot be precisely measured and thus are included in 'μ'. Correlation between the two error terms, verifies the existence of endogenous selection.

Following the intuition of Cohen (2003) and An and Chan (2008) who also deal in their research with endogenous dichotomous variables, we demonstrate our attempt to correct for self selection bias in the following augmented model:

$$E[\text{Unerpricing or Price Revisions} \mid CR = 1] = \beta' X + \gamma + E[\varepsilon \mid CR = 1]$$

$$= \beta' X + \gamma + \rho \, \sigma_\varepsilon \frac{\varphi(\omega' W)}{\Phi(\omega' W)} \quad (3)$$

Similarly, the model for non-rated IPOs is:

$$E[\text{Unerpricing or Price Revisions} \mid CR = 0] = \beta' X + \rho \, \sigma_\varepsilon \frac{-\varphi(\omega' W)}{1-\Phi(\omega' W)} \quad (4)$$

By deducting specifications (3) and (4) we derive the expected impact of credit rating(s) on the level of initial returns:

$$E[\text{Unerpricing or Price Rev.} \mid PMC = 1] - E[\text{Unerpricing or Price Rev.} \mid PMC = 0] = \gamma + \rho \, \sigma_\varepsilon \frac{\varphi(\omega' W)}{\varphi(\omega' W)(1-\Phi(\omega' W))} \quad (5)$$

In which Φ and φ respectively, stand for the cumulative and density distribution function of the standard normal distribution.

Econometrically, equation (5) provides both the sign and scale of the effect of CRs on IPO pricing. This information is given via the coefficient 'γ' which corresponds to the OLS estimate in equation (1). However, now we can eliminate bias with the addition of the Inverse Mills Ratio (λ) that was missing from the initial multivariate analysis. The correction term conditional on rating existence, takes the following form:

$$\lambda = \frac{\varphi(\omega' W)}{\Phi(\omega' W))} \text{ if CR=1 or } \lambda = \frac{-\varphi(\omega' W)}{1-\Phi(\omega' W))} \text{ if CR=0}$$

This method describes the treatment effect model that we employ in order to tackle endogeneity. Additionally, we incorporate in our analysis a two stage instrumental variable (IV) approach in the spirit of Heckman (1978) and Wooldridge (2002). Under this framework we no longer have to assume normality in the distribution of residuals and thus the validity of results of our treatment analysis could be challenged. Essentially, in the 2SLS procedure the first step is a probit regression of the endogenous variable against the vector of all the available instruments that constitute 'W'. In the second step, equation (1) is estimated with OLS while the dichotomous regressor CR is replaced by the fitted probabilities we obtained from the reduced form. The employment of predicted values as instruments is crucial for our analysis. Since the extant literature does not specifically dictate a set of parameters that should be included in equation (2), this methodology provides a degree of flexibility in the assortment of explanatory variables.

4.6 Empirical Analysis

To verify that multicollinearity is not affecting our results we conduct a pairwise correlation test for all variables included in this study. Additionally, we use the variance inflation factor (VIF) check, to examine whether the variance of any given regressor augments due to its interdependence with other coefficients. Results show that VIF remains always low (less than five in every specification). With respect to our concern for feedback effects the Durbin, Wu, Hausman method rejects the hypothesis of no endogeneity and validates the inclusion of the treatment effect and IV approach. Lastly, it is important to mention that we account for industry as well as year fixed effects throughout our analysis as potential IPO clustering could destabilize the reliability of our findings (refer to Cao and Shi, (2006)).

4.6.1 Determinants of Credit Rating acquisition

The econometric models we describe in the methodology section rely on a probit regression which estimates the company's probability to obtain one or multiple ratings. This probit specification corresponds to the first stage step both for the treatment effects and the generated instrumental variable method and yields a pseudo R^2 of 0.36

We look into relevant literature to determine the factors that augment the firm's likelihood to secure credit rating(s) and include them in 'W' as explanatory variables of our selection equation. Empirical evidence (Barclay and Smith, (1995); Graham, (1996); Graham, Lemmon and Scallheim, (1998); Hovakimain, Opler and Titman, (2001)) from prior studies focusing on debt markets, proposes that rated companies encompass clearly different characteristics than the unrated ones. One of these elements is company size. As the issuance of public debt as well as the acquisition of rating(s) is a process that entails significant fixed costs it is reasonable to assume that only large firms can incur such an expense. In our analysis we employ the natural logarithm of net sales to proxy for size.

Apart from how large the firm is, recent research (Faulkender and Petersen, (2006); Liu and Malatesta, (2006) and An and Chan, (2008)), contents that the number of years elapsed from the day of incorporation, the degree of profitability, the amount of tangible assets and the limited prospects of future growth are also factors that incline a company to seek CRAs' evaluations.

With respect to the age of the organization, authors (Ritter, (1984); Schultz, (1993); and Carter and al, (1998)) suggest that the years that passed from the founding day of the firm until the initial offering, constitute one important measure of IPO risk. The logic behind this argument is that older companies have proven their endurance in recurring market fluctuations and are better know to the general public. Thus, we expect lower level of information asymmetries compare to newly established entities. To confine the effect of age, we include in equation (2) the dichotomous variable 'aged' which is equal to unity when five or more years have elapsed between the incorporation and the first trading day and zero otherwise.

Another determinant of the firm's risk profile that affects the odds of securing a rating is profitability. Following the intuition of Liu and Malatesta (2006), we claim that cash affluent corporations are more likely to issue public debt and seek evaluation from CRAs. On the other hand, entities in financial distress face high default probability and prefer to strike a resolution with private lenders. In this study we employ the ratio of earnings before interest taxes depreciation and amortization to total assets as proxy of profitability and we include it in our probit specification.

An additional company specific factor that is common among rated firms is the possession of a relatively high amount of fixed assets. Arguably, companies with valuable

tangible resources can more efficiently facilitate access to the funds of lenders by using their property as collateral. To surrogate for the value of assets, we include in the selection equation the ratio of property plant and equipment to total assets. Also, we follow the suggestion of An and Chan (2008) and include in the first stage model the 'growth' variable that is estimated as R&D expenses scaled by net sales. We do so, as we expect that high growth firms would be more prone to issue private debt and refrain from seeking credit rating acquisition.

Furthermore, a plethora of prior studies (Houston and James, (1996); Johnson, (1997); Spindt and Subramaniam, (1998); Cantillo and Wright, (2000) and Denis and Mihov, (2003)), point out that the ability of the company to take on sufficient amount of leverage reflects its reputation in the credit market and smooth the progress of public debt issuance. Consequently, we expect CRA's clients to be highly leveraged entities and we control for this fact in our probit model by including the ratio of debt to total assets for year preceding the IPO.

In conjunction with the notion that superior credit quality is a prominent feature of corporations with credit ratings, we argue that inclusion of an estimator of default risk in our selection equation is imperative. Following the seminal work of Altman (1968), we rely on the Z-score to estimate the odds of bankruptcy of a company within the following one or two years. As the Z-score increases the chances of a firm going out of business diminish. Thus, we anticipate rated entities to be associated with higher scores. Since the original Altman's score refers to public companies we slightly adjust our approach by calculating the Z-score for private firms as suggested by Altman (2000):

Z= 6.56 (Working Capital/Total Assets) + 3.26 (Retained Earnings/Total Assets) + + 6.72 (Earnings before interest and taxes/ Total Assets) + 1.05 (Book value of equity/Book value of total liabilities)

Lastly, Faulkender and Petersen (2006) raise the consideration that companies operating in industries where a large proportion of firms are already rated; are more likely to seek evaluation by CRAs'. To cope with this concern, we include in our probit model the logarithm of one plus the fraction of rated corporations in the same three digit industry according to the US standard industrial classification system. Table (4), presents the output of the first stage regression.

4.6.2 Acquisition of single credit rating and IPO pricing

Table 5 presents regression output on the effect single credit ratings exert on underpicing. To illustrate the robustness of our results, we report the estimated coefficients from all the econometric models employed in our analysis: OLS (Columns 1, 4, 7 and 10), Heckman treatment effects method (Columns 2, 5, 8 and 11) and the generated instrumental variables approach (Columns 3, 6, 9 and 12). The dependent variable is the level of initial returns measured as the percent difference between the closing and offer price at the first trading day. The list of control variables encompasses key indicators which according to relevant literature explain much of the variance evidenced on the magnitude of underpricing. Namely we use:

IPO Proceeds: following the intuition of Beatty and Ritter (1986), we anticipate larger firms to have established strong corporate footprint in the market. Thus, outside investors are more familiar with the operations and prospects of bigger companies and perceive their issues as less speculative compare to smaller ones. Consequently, we suspect a negative relation between this variable and the amount of money left on the table.

Pre-IPO Net Sales: is also employed as proxy of firm size. Smart and Zutter (2003) and Arugaslan et al (2004) present evidence that as the natural logarithm of this indicator augments the company attracts increased attention from outsiders and as a result uncertainty decreases. Along these lines, we anticipate sales to be inversely related to underpricing.

Venture Capital backing: Megginson and Weiss (1991) demonstrate that the presence of reputable 'VC' financiers can significantly reduce initial returns. Distinguished venture capitalists not only are associated with a record of successful new offerings but also maintain major portion of ownership long after the IPO. This enduring investment horizon makes them vigilant against excess money left on the table. Based on this logic, we expect a negative sign on this coefficient in our models.

Underwriter Rank: relates to the alleged quality of the mediator that underwrites the issue. Carter and Manaster (1990), report abnormal first day returns for companies which hired prestigious underwriters. This is attributed to positive signals sent to market

participants via the decision to rely on a reputable IPO intermediary. We content that this relation will also appear in our analysis.

Overhang: pertains to the extent of dilution the company incurs at new issue day. Following the example of Bradley and Jordan (2002), we measure this indicator as the number of shares preserved by pre-IPO shareholders dived by total equity issued at the time of the offering. As underpricing costs are proportionately shared among investors who retain ownership after the firm goes public (refer to Lowry and Murphy, 2007), a small number of new shares (high overhang) brings the costs of dilution down and signifies high initial returns. Thus, a positive relationship is also assumed throughout this paper.

Primary Shares: assumes the value of one if the offering is merely primary and zero otherwise. Habib and Ljungqvist (2001), propose that firm owners seeking to sell their shares shortly after the IPO are the ones who suffer higher underpricing and dilution costs. Therefore, we predict that the degree of insider selling in a primary new issue increases the amount of money left on the table.

Exchange Listing: is a categorical variable equal to unity for companies listed on NASDAQ and zero otherwise. Based on evidence presented by Lowry and Shu (2002), offerings on this stock exchange are perceived as riskier and harder to value compare to NYSE/AMEX IPOs. As a result, initial returns are usually higher for NASDAQ companies.

Auditor Reputation: Following the example of Beatty (1989), we argue that when the auditing of a company's financial statements is prepared via a prestigious agent, vital information on firm's quality disseminates to outsiders and underpricing contracts. In our empirical analysis, we employ a dummy indicator which takes the value of one in the presence of a reputable auditor and zero otherwise.

Accounting for the effect the above variables exert on IPO performance we endeavor to provide evidence in support of our initial hypothesis (H.1). So far the extant literature consents on the information asymmetry alleviating role of CRAs in debt markets. However, in the context of new issues, very little and occasionally controversial findings are available. We shed light into this area by first investigating the relation between single credit ratings and the magnitude of underpricing.

Consistently, all three econometric models generate coefficients on the credit rating variables highly significant (at the 5% and 1% level of confidence) and corroborate the expected minus sign. In particular, results reveal that the presence of a rating from any of the three biggest US CRAs (specifications 1, 2, 3) strongly lessens the amount of money left on the table. The same conclusion holds when the three rating agencies are examined separately against the level of initial returns (specifications 4-12). Our findings extend the work of An and Chan (2008) by justifying that apart from Standard & Poor's also Moody's and Fitch associate with superior short-run IPO performance.

This empirical outcome aligns with studies (Morgan and Stocken (2003),Guntay and Hackbarth (2010)) claiming that firm evaluation by respectable and independent agents eliminates uncertainty about company quality via confidence enhancement of risk averse investors. More importantly, we observe that credit rating variables except from being a reliable proxy of the creditworthiness of an enterprise also divulge strong economic significance. Plainly, the instrumental variable approach denotes that 'Rating 'existence lowers underpricing by 12.23%. Even though, it is not possible to totally abolish other explanations of the inverse relation between CRs and initial returns, results concur with our first hypothesis.

The regression output regarding control variables is generally consistent with literature for all estimation procedures. Issues of older and larger companies (both in terms of proceeds and net sales) associate with less money left on the table as investors consider them less risky compare to younger and smaller rivals. The same holds true for the existence of a reputable auditor that eradicates uncertainty about the quality of a firm's financial statements. Moreover, we report a positive and highly significant coefficient for our overhang indicator. This verifies the suggestion of Bradley and Jordan (2002) that the cost of dilution is lower in offerings with higher overhang, signifying worse short term IPO performance. Similarly, underpricing increases for NASDAQ listings that are regarded more speculative compare to those on NYSE/AMEX. Interestingly, the (positive and significant) coefficients for underwriter reputation and venture capital backing, oppose the evidence presented by Carter and Manaster (1990) and Megginson and Weiss (1991) but align with Loughran and Ritter (2004) and Lowry and Murphy (2007). Further, it is not surprising that the primary shares variable relates positively to the level of initial returns. Rationally, firm managers with no intention to sell their part of ownership are not particularly concerned with the magnitude of underpricing.

4.6.3 Parallel rating acquisition and initial returns

Under the light of the above evidence that possession of a single credit rating constitutes an imperative means of uncertainty retrenchment, we turn our focus on the first trading day performance of multi- rated companies. In particular, we are inclined to scrutinize the effect a combination of ratings exerts on the amount of money left on the table. To effectively address this issue, we initially employ as main independent variable a categorical indicator which assumes the value of one for firms that combine two or three parallel evaluations (from the world's three leading CRAs) and zero otherwise. This variable is then regressed against the level of initial returns while the set of control parameters remains unchanged.

Findings of table 6, exhibit significance at all conventional levels of confidence, while upholding the minus sing. Results are robust across three estimation procedures and coefficients augment their impact on the dependent variable after accounting for feedback effects. With this outcome, parallel credit ratings demonstrate their capacity to stabilize the inherently uncertain going public process. This is due to the unambiguous incremental effect on first trading day performance of multi-rated companies. The economic significance that verifies the investment character of compound rating is apparent in the reduction of average underpricing from 22, 27% to 8,6% which translates to a gain of 608,255 million dollars. On the basis of this evidence we infer that the rating shopping hypothesis which suggests that competition among CRAs could incapacitate their appeal to market participants does not stand for potential investors of new listed companies.

4.6.4 Multiple credit rating combinations and IPO pricing

At this stage of analysis, we meticulously examine how specific groupings of US CRAs affect the (short run) success of new offerings. We are predominantly interested to verify whether certain rating combinations exert stronger impact on the level of initial returns. To facilitate the empirical approach we induce a categorical variable that assumes the value one for a particular CRA mixture and zero otherwise. In specifications 1-4, we scrutinize latent assortments of Standard & Poor's, first with Moody's and then with Fitch. Next, in models 5 and 6, the main variable of interest is the interaction among Moody's and Fitch and lastly our examination is consolidated with the inclusion of all rating agencies in specifications 7 and 8. To ascertain that endogeneity is not crippling

our results both the Heckman Treatment effects and the generated instrumental variables methods are employed. The panel of control regressors remains unchanged.

This thorough investigation of compound ratings, grants remarkable insights to their consideration as an effective mechanism that eradicates market frictions in situations where outside investors are in informational disadvantage. Table 7 reveals that coefficients of all feasible combinations of CRAs exhibit negative and highly significant effect on the money left on the table. The findings hold across both econometric methodologies and after adjusting for self selection bias, while control variables generate estimators in line with the existing literature.

4.6.5 Credit rating levels and initial returns

The empirical evidence presented so far corroborates the inverse relation between credit ratings and underpricing. At this part of the study, we endeavor to address the second research hypothesis. This suggests that along with credit rating existence also the soundness of firm's risk bearing capacity, as reflected by the level of the rating, can serve as uncertainty eliminator.

To investigate this inquiry we construct the variable ''CRL'' with data acquired from the Bloomberg database. Precisely, CRL takes values that range from 1 to 22 for Standard and Poor's with higher rating levels corresponding to larger numbers (i.e. 1 indicates a D rating and 22 a AAA rating). Similarly, this indicator arrays between 2 and 22 for Moody's (i.e. 2 for C rating and 21 for Aaa rating) and among 3 and 22 for Fitch (i.e. 3 for D and 22 for AAA).

To fully capture the effect of CRL on the money left on the table we run four separate regression specifications, one for each CRA plus an additional model where the rating levels of all agencies are taken into consideration. Given the ordinal nature of our main explanatory variable the two stage least squares method is regarded as most suitable for generation of unbiased results.

Table 8, presents regression output on the relation of credit rating levels with first trading day performance. Invariably, all CRL coefficients sustain negative sign and display statistical significance at the 5% level of confidence. This finding, confides an interesting market implication. Particularly, we observe that outside investors under the

burden of information asymmetry reward with less underpricing firms that retain high rating levels. Taking into account relevant studies (Hand et al (1992), Ederington and Goh (1998) and Boot et al (2006)) reporting sharp stock price declines at announcement of CRL downgrades (and vice versa), we could claim that outsiders associate the rating level with the company's operating viability as reflected by its risk bearing capacity.

4.6.6 The Effect of credit ratings on revisions of the filling price

The book building process initiates when underwriters file a price range reflecting their best approximation of IPO's offer price at that point in time. The need for accurate valuations requires mining of private information and vigilant monitoring of the way investors react to information available to the general public (Cornelli and Goldreich (2003)). The time devoted to road-shows (usually weeks or months) apparently serve this rationale but does not bring to a close the pricing assessment. The determination of the concluding offer price also rests upon certain level of contentment of the issuing firm and thus a balance among the company, underwriters and investors has to be established. Upon the outcome of the road-show managers of the issuing and underwriting entities could spark additional fierce discussions which can last even moments before the actual launch of the IPO.

Literature on this field, systematically quantifies bookbuilding variance as offer price divergence from the average of the initial filling price array (Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), Spatt and Srivastava (1991), Hanley (1993), Cornelli and Goldreich (2003)). Due to its wide ranging nature we anticipate this metric to be a good fit in our quest to depict bookbuilding under the credit rating regime. We investigate this issue, in order to address the third research hypothesis raised in this study. The results are presented in table 9.

To accentuate the facilitating role of credit ratings on filing price revisions, we endow with a dual set of estimations focusing on both individual and combination of ratings. On this basis, panel A reports findings for the three individual US CRAs. The main independent variable is a binary indicator which equals to unity in the presence of a particular agency and zero otherwise (i.e. Specifications: 1-3 correspond to Standard and Poor's, 4-6 to Moody's and 7-9 to Fitch). All other control regressors are the same as

in previous sections since price filling during the bookbuilding process is generally influenced by the same firm and issue relevant characteristics.

Columns (1), (4) and (7) illustrate OLS results of the proposed model. Coefficients of CRAs are negative and significant at the 1% level, providing first round support for our third hypothesis. Nevertheless, the aforementioned concern for feedback effects and self selection bias amounts to our reluctance to formulate conclusions based on these findings. Columns (2), (5) and (8) apply the Heckman treatment effect method and via a strongly significant inverse Mills ratio confirm our suspicion. To further strengthen the robustness of our approach we also use the generated instrumental variables estimation in columns (3), (6) and (9) respectively. This way we increase the magnitude of CRA coefficients and verify their high significance and adverse impact on bookbuilding variance.

Similarly, in panel B the same methodological approach is employed but this time for all possible combinations of compound ratings. Once more the regression outcome grants strong evidence in favor of hypothesis 3.

4.7 Additional Robustness Checks

This study provides empirical evidence confiding the value of multiple credit rating acquisition in various aspects of the going public process. Prior sections emphasize the uncertainty mitigating role of CRAs as reflected by lower underpricing echelon and the lessen range of filling price revisions. Further, we support the notion that credit rating levels mirror the firm's quality and consequently exert incremental effects on first trading day performance. In this part of our research, we supply a set of robustness checks to verify the validity of our results.

4.7.1 Investment Grade levels and IPO pricing

To comprehensively substantiate the information disseminating character of CRAs, we pore over the association of investment grade ratings with money left on the table. If the existence of credit ratings per se, as well as the rating level, are effective proxies of an enterprise's quality then we expect higher CRA evaluations to relate with superior short run IPO performance. The optimal way to test this issue is to specifically focus on companies maintaining investment grade ratings. Following Helwege and Turner (1999), we include in this category ratings that rank from BBB- and higher for Standard & Poor's along with Fitch and from Baa3 and higher for Moody's.

Intuitively, we base our rationale on relevant studies that focus on equity markets and establish evidence of pattern reactions among stock prices and rating level variations. Ederington and Goh (1998); Blanco et al (2005) and Jorion et al (2005) confirm systematically larger abnormal returns for investment grade firms compare to those with speculative ratings. This effect is attributed to the ability of credit rating levels, to at least partially determine investor confidence.

In the context of our study, we scrutinize the relation of investment grade ratings with initial returns via the inclusion of a binary variable 'INVESTGRD' which assumes the value of one for firms with such rating and zero otherwise. This indicator is then regressed against underpricing in two estimation models. The first incorporates a matched sample of rated firms only and the second integrates the total amount of new offerings included in our research. As in the main analysis section, we rely on Heckman treatment effect method to account for potential endogeneity and we maintain the same set of control variables. Findings are reported in table 10.

Perpetually, the estimated coefficients demonstrate high statistical significance (5% and 1% respectively) with negative signs in both econometric approaches. In addition, control regressors behave exactly as predicted by literature. Further, we observe an interesting augmentation in terms of significance and magnitude of predicted results when investment grade firms are tested against the total sample. Rationally, in a setting where the existence of credit ratings is by itself an important facilitator of the going public process, the impact of rating levels on IPO performance is more pronounced when rated issues are contrasted with non rated ones. This outcome is in complete agreement with the focal point of our empirical investigation as discussed previously.

4.7.2 Effect of multiple credit ratings on Tobin's Q

Our main body analysis tenders justification to the beneficial upshots of compound rating acquisition on the level of initial returns. As an additional robustness implementation, we revert to the relation of multiple credit ratings with firm performance from a new perspective. In particular, Tobin's Q is employed as an alternative dependent

variable in order to investigate the effect various CRA combinations exert on company value.

Following Chung and Pruitt (1995), we compute this indicator by dividing the summation of total equity, (net) current liabilities and the book value of withstanding long term debt with total assets. As Montgomery and Wernerfelt (1988) point out, Tobin's Q constitutes an effective surrogate of an enterprise's competitive advantage. This is because the Q ratio echoes projected cash inflows and thus confine the time lag elapsing between an investment decision (such as the choice to obtain credit ratings) and realized proceeds. Further, it is less vulnerable to accounting distortions compare to other measures like ROA (Lindenberg and Ross, 1981). In this setting a ratio larger than one designates higher growth opportunities.

Methodologically, to examine the aforementioned issue we create a set of binary variables for all possible CRA permutations. Precisely, in specifications (1) and (2), the estimator ''S&P, Moody's'' equals to unity for companies that secured ratings from these particular agencies (prior to their IPO) and zero otherwise. Respectively, the same logic applies to ''S&P, Fitch'', ''Moody's, Fitch'' and ''S&P, Moody's, Fitch''. To make sure that self-selection bias is not affecting our findings, both OLS and the two stage least squares method are used. Table 11, reports the results.

Consistently, all CRA coefficients present high statistical significance (at the 1% level) and exhibit positive sign across both econometric procedures. At the same time, the vector of control variables remains in the same direction that was discussed in previous sections. This outcome completely aligns with the basic notion of this study that the existence of multiple credit ratings by the three leading CRAs (prior to the listing) disseminates superior quality to outside investors.

4.7.3 Impact of various CRA combinations on investor valuation

To extra strengthen our main supposition that credit ratings represent an effectual means of improving the new offering's success, we seek an alternate way to appraise how investors value rated companies in an IPO framework. On this basis, we hinge on prices market participants place on IPOs as an additional dependent variable. Based on the influential work of Welbourne and Andrews (1996) and Nelson (2003), we claim that investor valuation detains the premium placed on a corporation's total assets by potential

investors. To quantify this concept we follow Certo et al (2003) and define our new variable as the percentage difference of the offer price and the book value of equity. In such context larger premia are assigned to more encouraging projects. Econometrically, we employ a Heckman treatment effects model where various CRA combinations are regressed against the investor valuation indicator while control variables remain unchanged.

All estimations sustain a strong (at the 1% level of confidence) and positive relationship among investor valuations in every possible grouping of the three leading US credit rating agencies. Once more, this finding validates the investment character of ratings as evidenced by their ability to disseminate information on firm quality.

4.7.4 Other testings

We further provide auxiliary tests against potential causes of bias by commencing the subsequent adjustments: (1) measuring initial returns to the end of the eleventh day of trading and first trading month (as suggested by Chambers and Dimson, 2009); (2) eliminating lingering financial new listings; (3) censoring underpricing at the first and ninety-ninth in addition to the fifth and ninety-fifth percentiles to account for outliers; and (4) conducting propensity score matching analysis to estimate the average treatment effects of credit rating acquisition on money left on the table. The reported coefficients in all of these estimations stay qualitatively alike and for concision are suppressed. Rated firms monotonically associate to superior short run IPO performance and predispose filling price revisions downwards verifying the robustness of our empirical evidence.

4.8 Conclusion

In the first paper to associate multiple credit rating acquisition to the IPO performance, we demonstrate that prospective issuers who set up a record of ratings from the three largest U.S. CRAs leave less money on the table at the first trading day. As it is easily traceable and also publicly available, a record of credit rating acquisitions comprise an effective channel through which information on the corporation's increased risk bearing capacity is disseminated to outsiders. Consequently, potential investors of a new listing are more confident that the company will face fewer market frictions and thus

require lower premia in order to procure its equity. On this basis, the IPO firm can initiate operations as a public entity by incurring modest level of underpricing when it will enter a stock exchange for the first time.

Addressing the set of research questions that were raised in the introduction, our paper explains that credit rating existence per se from the world's leading CRAs forms an appropriate proxy of firm quality as evidenced by the distinguished short run performance of the rated IPOs. Invariably, ratings from each agency exhibit strong and adverse impact on the level of initial returns. Based on this inference, we take an extra step to assess whether the same pattern persists in the case of compound ratings. To this end, we run a range of regression specifications that scrutinize the effect of all possible combinations of rating agencies and we confirm that multi-rated companies contribute significantly to the mitigation of uncertainty in the going public process. This conclusion holds both for double and triple rating possession. Additionally, the grade level of the assigned ratings of each CRA, further contributes to a successful first trading day. Our study provides evidence in support of the notion that higher ratings are awarded to firms that investors perceive as less risky. At last, results reveal a fairly interesting phenomenon. Namely, the facilitating role of credit ratings is also present in the price discovering process during the book building period. Robust econometric output shows that CRAs' evaluations consistently filing price revisions downwards.

Assessing the fundamentals of rated IPOs, we discover that these issues are related to better quality as proxied by the extent of operational experience, market share, and the amount of proceeds raised. Additionally, alternative issuer specific variables such as the Tobin's Q ratio and investor valuations also verify the beneficial aspects of seeking CRA evaluations. Therefore, it becomes reasonable that rated companies engage in the costly investment of rating acquisition in an effort to handle in time market frictions and uncertainties that lay ahead.

Appendix A: Variable Definitions

Panel A: Measures of IPO pricing	
Underpricing (Initial Return)	The percentage difference between the first day closing price available on CRSP and the offer price as reported in the firms' S-1 documents.
Filing Price Revisions	The difference between offer price and the midpoint of the initial filing price range, divided by the offer price.
Tobin's Q	The summation of total equity, (net) current liabilities and the book value of withstanding long term debt divided by total assets.
Investor Valuation	The percentage difference of the offer price and the book value of equity as reported in the companies' prospectuses
Panel B: Credit Rating related variables	
Credit Rating Existence (CRD)	Categorical Variable which assumes the value of 1 if the firm secures credit rating from any of the three largest CRAs and 0 otherwise.
Standard & Poor's (S&P)	Binary indicator that equals to unity for companies that obtain a rating specifically from Standard & Poor's and 0 otherwise
Moody's (MDY)	Dummy variable that equals to 1 for firms that obtain a rating specifically from Moody's and 0 otherwise
Fitch (FIT)	Dummy variable that equals to 1 for firms that obtain a rating specifically from Fitch and 0 otherwise
{2} or {3} Ratings	Categorical indicator equal to 1 for firms that secure multiple credit ratings (either 2 or 3) from the three largest U.S. CRAs
S&P Moody's	Categorical indicator equal to 1 for firms that secure credit ratings specifically from Standard & Poor's and Moody's and 0 otherwise
S&P Fitch	Binary variable equal to 1 for firms that secure credit ratings specifically from Standard & Poor's and Fitch and 0 otherwise
Moody's Fitch	Dummy variable equal to 1 for firms that secure credit ratings specifically from Moody's and Fitch and 0 otherwise
S&P Moody's Fitch	Categorical indicator equal to 1 for firms that secure credit ratings from all the three leading U.S. CRAs and 0 otherwise
Credit Rating Levels (CRL)	Grade of rating prior the IPO event. The value of 22 is assigned for AAA ratings, 21 for next lower grade (AA) and so on until we reach the lowest grade (D) which takes the value of 1.
Investment Grade (InvestGrd)	Binary indicator that equals to unity for companies obtaining investment grade ratings and 0 otherwise.
Panel C: IPO characteristics	
NASDAQ Listing (Exchange)	Categorical variable equal to 1, for NASDAQ listings and 0 otherwise.
Share Overhang (Over)	The ratio of shares that pre-IPO shareholders retain over the new shares issued at the offering.
Underwriter Ranking (Under)	Categorical indicator equal to 1 for new listings employed underwriters of the highest prestige ranking, following Loughran and Ritter (2004) database and 0 otherwise
Auditor Reputation (AudRep)	Binary variable equal to 1 for the existence of a reputable auditor and 0 otherwise.
Firm Age (LnAge)	The natural logarithm of the number of years elapsed from the company's foundation to the year of IPO. Dates are obtained from the Field-Ritter database.
Venture Capital (Vent Cap)	Binary variable equal to unity for firms with venture capital backing and 0 otherwise.

Primary Shares (Prim)	Dummy variable that is equal to 1 if the offering is exclusively primary and 0 otherwise
Gross Proceeds (LnProceeds)	The natural logarithm of the total amount of proceeds raised at the first day of trading.
Sales (LnSales)	The natural logarithm of net sales in pre-IPO year as proxy of firm size
	Panel D: List of employed instruments
Industry Fraction (INDFRAC)	The natural logarithm of 1+ the fraction of firms in the same industry that secure credit ratings
Altman-z (z-score)	6.56 (Working Capital/Total Assets) + 3.26 (Retained Earnings/Total Assets) + 6.72 (Earnings before interest and taxes/ Total Assets) + 1.05 (Book value of equity/Book value of total liabilities)
Tangibility	The company's property, plant and equipment divided by total assets
Growth	Research and development expenditures divided by net sales
Profit	Earnings before interest, taxes, depreciation and amortization divided by total assets
Aged	Dummy variable equal to unity if the company was at least 5 years old at the day of the IPO and 0 otherwise.
Leverage	The ratio of total debt to total assets in the pre-IPO year
Shares	The total number of shares issued

Table 1: Summary Statistics

The table reports descriptive statistics for a sample of 2,541 US IPOs over the period 1997-2014. Panel A. from the left hand side identifies in time the distribution of rated and unrated IPOs both as absolute number and as percent of total sample. The right side of Panel A presents the allocation of credit ratings across the three leading US CRAs. Panel B. reports the allocation of rating levels for all rated companies. The number of firms with the same rating appears in a parenthesis

Panel A: Distribution in time of rated and unrated IPOs

Year	Total Sample		Rated IPOs		Unrated IPOs		S&P		Moody's		Fitch		Total Rated
	N	%	N	%	N	%	N	%	N	%	N	%	%
1997	213	8.38	24	0.94	189	4.53	10	0.04	9	0.04	5	0.02	0.10
1998	140	5.51	25	0.98	115	8.74	11	0.04	10	0.04	4	0.02	0.10
1999	243	9.56	21	0.83	222	8.50	9	0.04	7	0.03	5	0.02	0.08
2000	237	9.33	21	0.83	216	2.44	9	0.04	7	0.03	5	0.02	0.08
2001	76	2.99	14	0.55	62	2.56	6	0.02	5	0.02	3	0.01	0.06
2002	74	2.91	9	0.35	65	2.79	5	0.02	2	0.01	2	0.01	0.04
2003	80	3.15	9	0.35	71	4.64	4	0.02	3	0.01	2	0.01	0.04
2004	136	5.35	18	0.71	118	5.55	9	0.04	5	0.02	4	0.02	0.07
2005	155	6.10	14	0.55	141	5.47	8	0.03	6	0.02	0	0.00	0.06
2006	155	6.10	16	0.63	139	5.59	7	0.03	5	0.02	4	0.02	0.06
2007	150	5.90	8	0.31	142	0.91	3	0.01	2	0.01	3	0.01	0.03
2008	24	0.94	1	0.04	23	1.22	1	0.00	0	0.00	0	0.00	0.00
2009	41	1.61	10	0.39	31	3.42	4	0.02	3	0.01	3	0.01	0.04
2010	100	3.94	13	0.51	87	3.97	5	0.02	4	0.02	4	0.02	0.05
2011	106	4.17	5	0.20	101	4.21	2	0.01	2	0.01	1	0.00	0.02
2012	115	4.53	8	0.31	107	8.89	3	0.01	3	0.01	2	0.01	0.03
2013	243	9.56	17	0.67	226	4.53	7	0.03	6	0.02	4	0.02	0.07
2014	253	9.96	19	0.75	234	8.74	8	0.03	7	0.03	4	0.02	0.08
Total	**2541**	**100**	**252**	**9.92**	**2289**	**90.08**	**111**	**0.44**	**86**	**0.34**	**55**	**0.22**	**100**

Panel B: Allocation of credit rating levels across the three leading US CRAs

	S&P		Moody's		Fitch	
Assigned Level	Grade	N	Grade	N	Grade	N
22	AAA (INV GRD)	0	Aaa(INV GRD)	0	AAA(INV GRD)	0
21	AA+ (INV GRD)	5	Aa1(INV GRD)	3	AA+(INV GRD)	1
20	AA (INV GRD)	1	Aa2(INV GRD)	2	AA(INV GRD)	2
19	AA-(INV GRD)	7	Aa3(INV GRD)	8	AA-(INV GRD)	0
18	A+(INV GRD)	2	A1(INV GRD)	1	A+(INV GRD)	0
17	A(INV GRD)	3	A2(INV GRD)	4	A(INV GRD)	0
16	A-(INV GRD)	0	A3(INV GRD)	2	A-(INV GRD)	3
15	BBB+(INV GRD)	3	Baa1(INV GRD)	4	BBB+(INV GRD)	2
14	BBB(INV GRD)	19	Baa2(INV GRD)	17	BBB(INV GRD)	2
13	BBB-(INV GRD)	16	Baa3(INV GRD)	14	BBB-(INV GRD)	5
12	BB+(SPECUL.GRD)	3	Ba1(SPECUL.GRD)	5	BB+(SPECUL.GRD)	5
11	BB(SPECUL.GRD)	4	Ba2(SPECUL.GRD)	2	BB(SPECUL.GRD)	11
10	BB-(SPECUL.GRD)	2	Ba3(SPECUL.GRD)	1	BB-(SPECUL.GRD)	9
9	B+(SPECUL.GRD)	12	B1(SPECUL.GRD)	6	B+(SPECUL.GRD)	6
8	B(SPECUL.GRD)	10	B2(SPECUL.GRD)	5	B(SPECUL.GRD)	6
7	B-(SPECUL.GRD)	9	B3(SPECUL.GRD)	4	B-(SPECUL.GRD)	1
6	CCC+(SPECUL.GRD)	2	Caa1(SPECUL.GRD)	1	CCC(SPECUL.GRD)	3
5	CCC(SPECUL.GRD)	7	Caa2(SPECUL.GRD)	3	DDD(SPECUL.GRD)	0
4	CCC-(SPECUL.GRD)	6	Caa3(SPECUL.GRD)	4	DD(SPECUL.GRD)	0

Table 2: Descriptive Statistics for IPO deals

This table presents descriptive statistics for a sample of 2,541 IPOs that floated the U.S. stock exchanges form 1st of January 19977 to the 31th of December 2014, along with the subsample of new listings with and without credit ratings. The new listings are retrieved from the Securities Data Company (SDC) database. The statistics incorporate the mean, median, minimum, maximum and standard deviation for all dependent variables included in our analysis as well as for all control variables used in every specification model. The presentation for each variable finishes off with a test for difference in the means of sub-samples. Panel A portrays the key measures of IPO pricing i.e. *underpricing*, *revisions*, *Tobin's Q* and *investor valuation.* Panel B illustrates the IPO specific characteristics employed in our analysis. Data for stock prices comes from CRSP while all accounting data are collected from Compustat. Detailed definitions of all variables are provided in the Appendix.

	Full Sample (N= 2541)				IPOs with credit ratings (N = 252)				IPOs without credit ratings (N=2289)				P-value
	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	T -Diff
	s.d.				s.d.				s.d.				
Panel A – IPO pricing													
Initial Return	0.22	0.11	-0.43	5.07	0.18	0.5	-0.2	1.23	0.27	0.26	-0.43	5.07	0.00
	0.44				1.95				0.48				
Filling price revision	-0.25	0.00	-1.82	1.57	-0.2	-1.5	-0.47	1.47	0.2	0.1	-1.82	1.57	0.01
	1.62				1.67				1.89				
Tobin's Q	0.23	0.5	0	7.5	0.46	0.41	0.65	2.8	0.19	0.29	0	7.5	0.03
	0.25				0.34				0.29				
Investor Valuation	0.63	0.23	-3.73	3.38	0.71	0.31	0.58	2.12	0.42	0.2	-3.73	3.38	0.00
	1.04				2.57				9.2				
Panel B– IPO characteristics													
Overhang	3.61	2.75	0.00	70.54	3.91	2.93	0.00	61.32	3.38	2.77	0.00	81.45	0.19
	3.12				3.63				3.14				
Venture Capital Backing	0.58	0.00	0.00	1.00	0.45	0.00	0.00	1.00	0.50	0.00	0.00	1.00	0.01
	0.67				0.59				0.50				
Underwriter Reputation	0.62	1.00	0.00	1.00	0.82	1.00	0.00	1.00	0.58	1.00	0.00	1.00	0.00
	0.49				0.38				0.49				
NASDAQ Listing	0.66	1.00	0.00	1.00	0.50	0.00	0.00	1.00	0.73	1.00	0.00	1.00	0.02
	0.40				0.50				0.45				
Primary Shares	0.63	1.00	0.00	1.00	0.59	0.00	0.00	1.00	0.68	1.00	0.00	1.00	0.00
	0.47				0.49				0.47				
Log (Net Sales)	1.65	0.48	-2.67	5.02	2.66	1.04	0.00	5.02	1.50	1.06	-2.67	4.49	0.00
	1.08				0.96				1.01				
Proceeds	148.5	62.05	0.87	11.946	345.79	123.71	9.22	11.946	91.38	61.82	0.81	14.258	0.00
	432.28				1.019				.115.42				
Firm Age	17.31	9.00	0.00	164.00	25.94	12.00	0.00	164.00	12.59	7.00	0.00	44.00	0.00
	24.16				37.02				19.38				
Auditor Repuation	0.51	1.00	0.00	1.00	0.74	1.00	0.00	1.00	0.23	1.00	0.00	1.00	0.00
	0.50				0.44				0.20				

Table 3: Correlation matrix

The table presents pairwise correlations of variables employed in our study. The sample consists of 2,541 US IPOs over the period 1997-2014. Panel A, reports correlations of control variables while Panel B, shows correlations for variables that influence a firm's decision to acquire credit ratings. IPO deals are obtained from the Securities Data Company (SDC) Database whereas accounting variables are collected from CRSP and Compustat databases. The detailed definitions of all estimators used in our analysis are provided in the Appendix.

	Panel A: IPO variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Overhang	1									
2.	Venture Capital Backing	0.14	1								
3.	Proceeds	-0.05	-0.09	1							
4.	Underwriter Reputation	-0.03	-0.03	-0.02	1						
5.	Auditor Reputation	0.07	0.06	0.07	-0.17	1					
6.	NASDAQ Listing	0.01	0.3	-0.14	0.06	-0.14	1				
7.	Age	-0.05	0.03	0.03	-0.01	0.07	0.02	1			
8.	Revisions	0.1	0.11	0.04	0.02	0.15	-0.01	-0.06	1		
9.	Primary Shares	0.06	0.09	-0.05	0.08	-0.18	0.07	-0.15	-0.01	1	
10.	Sales	-0.06	-0.31	0.26	-0.09	0.25	-0.27	0.31	0.04	-0.35	1

	Panel B: Credit rating variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)
11.	Industry Fraction	1						
12.	Tangibility	0.07	1					
13.	Shares	0.28	0.05	1				
14.	Growth	-0.04	-0.01	-0.06	1			
15.	Profit	0.06	0.27	0.14	-0.01	1		
16.	Leverage	-0.01	-0.01	-0.02	0.5	0.03	1	
17.	Altman-Z	0.07	0.02	0.01	0.4	0.02	-0.52	1

Table 4: Determinants of credit rating acquisition for IPO deals

The table presents results of the probit regression for the probability of credit rating acquisition on a set of credit rating determinants. The sample is composed of 2,541 U.S. IPOs that floated stock exchanges from the 1st of January 1997 to the 31th of December 2014. Column 2, reports the estimated coefficients and Column 3 the z-Statistics. All variables are defined in the Appendix. *,**,***, indicate statistical significance at the 10%, 5% and 1% level respectively.

Instrumental Variables	Coefficients	z-Statistic
INDFRAC	8.84***	10.53
Tangibility	0.146	0.96
Log(Shares)	0.763***	5.11
Log(Sales)	0.425***	3.42
Growth	-5.11	-0.12
Profit	0.095***	4.09
Age	0.082	0.32
Leverage	0.059	0.13
Altman-Z	0.0498**	3.25
N		2,541
Pseudo-R^2		0.36

Table 5: Effect of Individual Credit Ratings on IPO underpricing

This table presents results of IPO initial returns (dependent variable) on the three largest credit rating agencies and a set of control variables for a sample of 2,541 US IPOs over the period 1997-2014. For specifications 1-3, the main independent variable is equal to unity if the firm was evaluated by any of the three largest rating agencies (prior to the IPO) and zero otherwise. For specifications 4-6, the main independent variable is equal to one if the firm was rated by S&P (prior to the IPO) and zero otherwise. For specifications 7-9, the main independent variable is equal to one if the firm was rated by Moody's (prior to the IPO) and zero otherwise. For specifications 10-12, the main independent variable is equal to one if the firm was rated by Fitch (prior to the IPO) and zero otherwise. Three estimations are used: OLS, Heckman-Treatment Effects and generated instrumental variables. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

	Any Single Rating			**Standard & Poor's**			**Moody's**			**Fitch**		
VARIABLES	OLS	Heckman	2SLS	OLS	Heckman	2SLS	OLS	Heckman	2SLS	OLS	Heckman	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Rating	-10.17***	-12.23***	-7.14**									
	(1.52)	(1.2)	(3.53)									
S&P				-8.47***	-14.21***	-9.64**						
				(1.82)	(2.01)	(4.33)						
Moody's							-7.43***	-15.2***	-8.24**			
							(1.41)	(2.02)	(3.81)			
Fitch										-14.2***	-16.15***	-7.48**
										(4.79)	(5.27)	(1.97)
Ovehang	1.17***	1.74***	1.52***	2.16***	1.83***	1.82***	2.16***	1.63***	1.55***	2.18***	1.59***	1.23**
	(0.65)	(0.57)	(0.53)	(0.64)	(0.53)	(0.51)	(0.64)	(0.52)	(0.54)	(0.65)	(0.51)	(0.42)
Vent Capital	19.19***	17.62***	17.75***	22.42***	17.77***	17.79***	22.56***	17.93***	17.86***	22.97***	18.34***	16.09***
	(2.12)	(2.02)	(2.08)	(2.26)	(2.01)	(2.05)	(2.19)	(2.03)	(2.07)	(2.19)	(2.04)	(1.67)
Underwriter	7.38***	5.9***	5.84***	7.29***	5.77***	5.91***	7.18***	5.59***	5.87***	6.87***	5.41***	4.29**
	(2.18)	(2.04)	(2.06)	(2.17)	(2.03)	(2.06)	(2.18)	(2.03)	(2.06)	(2.16)	(2.02)	(2.02)
Auditor Rep.	-4.28	-1.41	-1.25	-2.48	-1.45	-1.31	-2.54	-1.58	-1.32	-2.88	-1.71	-1.28
	(2.69)	(2.12)	(2.31)	(2.458)	(2.12)	(2.31)	(2.49)	(2.11)	(2.12)	(2.61)	(2.31)	(2.27)
Exchange	3.42	1.22	1.72	2.52	1.73	1.75	2.14	1.69	1.88	3.02	2.15	1.43
	(2.22)	(1.82)	(2.12)	(2.22)	(1.82)	(2.01)	(2.11)	(2.11)	(2.04)	(2.22)	(1.87)	(1.87)
Prim. Shares	5.89***	6.07***	1.11***	5.58***	5.91***	1.11***	5.51***	6.03***	1.11***	5.34***	5.55***	1.25***
	(1.74)	(1.62)	(0.15)	(1.73)	(1.62)	(0.15)	(1.73)	(1.63)	(0.15)	(1.74)	(1.62)	(0.15)
Revisions	0.69**	1.12***	5.98***	0.7**	1.11***	5.81***	0.71**	1.11***	5.76***	0.69**	1.12***	4.41***
	(0.22)	(0.14)	(1.65)	(0.2)	(0.15)	(1.63)	(0.23)	(0.14)	(1.63)	(0.2)	(0.15)	(1.58)
Log Proceeds	-8.49***	-1.91	-1.88	-8.27***	-1.91	-1.91	-8.17***	-1.79	-1.77	-7.91***	-2.12*	-2.02*
	(1.38)	(1.19)	(1.21)	(1.37)	(1.19)	(1.21)	(1.36)	(1.18)	(1.24)	(1.39)	(1.18)	(1.14)
Log Sales	-1.68	-4.36***	-3.58***	-1.78	-4.02***	-3.51***	-1.71	4.06***	-3.48***	-1.94	-3.21***	-1.84*
	(1.37)	(1.17)	(1.16)	(1.37)	(1.15)	(1.15)	(1.38)	(1.14)	(1.14)	(1.37)	(1.08)	(1.01)
Log Age	-1.14	-0.35	-0.26	-1.25	-0.23	-0.24	-1.36	-0.21	-0.15	-1.42	-0.018	-0.87
	(0.91)	(0.81)	(0.82)	(0.91)	(0.82)	(0.82)	(0.915)	(0.82)	(0.82)	(0.92)	(0.83)	(0.67)
Constant	-151.2***	-72.23***	-64.04***	-141.9***	-69.02***	-60.45***	-148.9***	-69.8***	-62.07***	-142.3***	-54.46***	-22.95*
	(22.09)	(21.34)	(21.42)	(24.82)	(20.82)	(21.04)	(24.85)	(20.71)	(20.97)	(24.69)	(19.73)	(18.1)
N	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541
Adjusted-R^2	0.18	-	-	0.17	-	-	0.17	-	-	0.18	-	-

Table 6: Effect of multiple credit rating acquisition on underpricing

This table presents results on the effect of parallel credit rating acquisition on the level of initial returns, for a sample of 2,541 US IPOs over the period 1997-2014. The econometric methods employed are: OLS, Heckman Treatment effects and generated instrumental variables (2SLS) approach. In all three specification models the main independent variable of interest is a categorical indicator which takes the value of one if a firms obtains more than one credit ratings prior to the year of IPO and zero otherwise. The list of instruments used in models 2 and 3 as well as the definition of the control variables are provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

VARIABLES	OLS (1)	Heckman (2)	2SLS (3)
{2} or {3} Ratings	-6.8***	-10.11 **	-13.54***
	(1.89)	(2.1)	(2.3)
Overhang	1.85***	1.62***	1.55***
	(0.51)	(0.46)	(0.23)
Venture Capital	15.01***	15.51***	16.88***
	(1.04)	(2.06)	(2.14)
Underwriter	6.73***	6.55***	5.89**
	(1.03)	(1.09)	(2.84)
Auditor Rep.	-0.51	-0.52	-0.33
	(0.12)	(2.2)	(2.11)
Exchange	1.01	1.61	1.66
	(0.01)	(1.01)	(1.12)
Primary Shares	5.87***	5.86***	5.96***
	(1.72)	(1.5)	(2.14)
Revision	2.14***	1.12***	1.11***
	(0.16)	(0.14)	(0.06)
Log Proceeds	3.21***	3.39***	3.42***
	(1.2)	(1.21)	(1.22)
Log Sales	-2.11*	-1.71	-1.41
	(1.09)	(1.18)	(1.31)
Log Age	0.11	0.31	0.21
	(0.71)	(0.62)	(1.05)
Constant	-52.31***	-59.88***	-62.1***
	(18.66)	(22.03)	(21.23)
N	2,541	2,541	2,541
Adjusted-R^2	0.29	-	-

Table 7: Do particular combinations of CRAs affect underpricing?

This table reports empirical output on the impact of various combinations of the three leading CRAs on the level of initial returns. Our main independent variable is a dichotomous indicator that assumes the value of one for firms that are rated by Standard & Poor's and Moody's (specifications 1 and 2), for firms that are rated by Standard & Poor's and Fitch (specifications 3 and 4), for firms that are rated by Moody's and Fitch (specifications 5 and 6) and for firms rated by all three CRAs (specifications 7 and 8). The list of instruments used in the employed models, as well as the definition of the control variables are provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

	S&P, Moody's		S&P, Fitch		Moody's, Fitch		S&P, Moody's, Fitch	
VARIABLES	Heckman	IV-2SLS	Heckman	IV-2SLS	Heckman	IV-2SLS	Heckman	IV-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
S&P Moody's	-11.15***	-11.02***						
	(3.01)	(3.04)						
S&P Fitch			-12.21***	-10.22***				
			(3.55)	(3.12)				
Moody's Fitch					-13.27***	-10.78***		
					(3.21)	(3.77)		
S&P Moody's Fitch							-16.12***	-8.76**
							(3.16)	(3.56)
Overhang	1.52***	1.41***	1.51***	1.38***	1.52***	1.55***	1.63***	1.38**
	(0.51)	(0.52)	(0.56)	(0.49)	(0.71)	(0.62)	(0.61)	(0.54)
Venture Capital	16.09***	15.62***	16.11***	15.78***	16.18***	15.75***	16.12***	13.72***
	(2.01)	(2.02)	(2.01)	(2.04)	(2.04)	(2.01)	(2.01)	(1.89)
Underwriter	6.49***	6.62***	6.514***	6.41***	6.32***	6.21***	6.43***	5.11**
	(2.01)	(2.03)	(2.02)	(2.01)	(2.01)	(2.04)	(2.02)	(2.01)
Auditor Rep.	-0.32	-0.22	-0.45	-0.38	-0.61	-0.23	-0.67	-0.08
	(2.07)	(2.08)	(2.07)	(2.08)	(2.06)	(2.08)	(2.08)	(2.11)
Exchange	1.93	1.85	2.04	2.03	2.08	2.09	2.04	1.1
	(2.01)	(2.01)	(2.01)	(1.99)	(2.01)	(1.99)	(1.99)	(1.97)
Revision	1.12***	1.14***	1.11***	1.15***	1.11***	1.15***	1.11***	1.23***
	(0.15)	(0.15)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.15)
Primary Shares	5.71***	5.21***	5.61***	5.23***	5.66***	5.17***	5.72***	4.24***
	(1.63)	(1.61)	(1.63)	(1.61)	(1.63)	(1.61)	(1.63)	(1.6)
Log Sales	-1.91	-1.56	-2.01*	-1.82	-2 *	-1.81	-1.98*	-1.91*
	(1.18)	(1.18)	(1.18)	(1.16)	(1.18)	(1.16)	(1.18)	(1.16)
Log Proceeds	3.18***	3.25***	3.17***	3.09***	3.12***	3.13***	3.36***	1.94*
	(1.08)	(1.12)	(1.08)	(1.09)	(1.07)	(1.1)	(1.09)	(1.01)
Log Age	0.17	0.55	0.15	0.49	0.13	0.43	0.041	0.85
	(0.83)	(0.65)	(0.83)	(0.67)	(0.84)	(0.68)	(0.83)	(0.67)
Constant	-44.12***	-46.6***	-44.03***	-43.21***	-42.07***	-43.83***	-54.16***	-32.71*
	(18.41)	(19.25)	(17.23)	(18.85)	(18.56)	(19.01)	(18.61)	(19.31)
N	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541

Table 8: Credit Rating Levels on IPO pricing

This table presents empirical output on the effect of credit rating levels on underpricing for a sample of 2,541 US IPOs over the period 1997-2014. The main independent variable in all four specifications is credit rating level (CRL). Specifications 1-3, examine the impact of CRL on initial returns for individual CRAs and specification 4 collectively investigates the relation between CRL and first day performance. The estimation procedure is based on a 2SLS model. The list of instruments used, as well as the definition of control variables, is provided in the appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

VARIABLES	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
CRL(S&P)	-0.59**			
	(0.22)			
CRL(Moody's)		-0.71**		
		(0.21)		
CRL(Fitch)			-0.32*	
			(0.17)	
CRL(All)				-0.48**
				(0.23)
Overhang	1.45**	1.37**	1.31**	1.37**
	(0.43)	(0.54)	(0.52)	(0.54)
Venture Capital	13.63***	13.72***	13.22***	13.61***
	(1.51)	(1.51)	(1.49)	(1.53)
Underwriter	5.54**	5.41**	5.51**	5.57**
	(1.04)	(1.03)	(1.04)	(1.04)
Auditor Reputation	-0.8	-0.82	-0.73	-0.61
	(2.11)	(2.12)	(2.12)	(2.11)
Exchange	1.08	0.99	1.52	0.98
	(1.92)	(1.91)	(1.91)	(1.91)
Primary Shares	6.31***	5.38***	5.31***	5.41***
	(1.27)	(1.28)	(1.21)	(1.28)
Revision	1.24***	1.24***	1.26***	1.23***
	(0.15)	(0.15)	(0.14)	(0.14)
Log Proceeds	2.13**	2.2**	1.8*	2.23**
	(1.06)	(1.06)	(1.01)	(1.08)
Log Sales	-1.85	-1.76	-2.08*	-1.84
	(1.17)	(1.19)	(1.15)	(1.16)
Log Age	1.14*	1.06	1.05	1.25*
	(0.68)	(0.71)	(0.75)	(0.65)
Constant	-44.61*	-45.83*	-38.32	-46.45*
	(18.02)	(18.12)	(18.05)	(18.42)
N	2,541	2,541	2,541	2,541
Pseudo-R^2	0.28	0.27	0.28	0.29

Table 9: Effect of credit ratings on revisions of the filling price

This table presents in two panels, the results of the impact credit ratings exert on price revisions for a sample of 2,541 US IPOs over the period 1997-2014. Panel A reports findings in a setting where single credit ratings and other control variables are regressed against revisions. Panel B, consists of specifications which have as main independent variable all possible combinations of the three leading US CRAs. To ascertain the robustness of our results each specification is run with three estimation procedures: OLS, Heckman treatment effects and IV-2SLS. The list of instruments used as well as the definition of the all variables is provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

Panel A: Effect of single credit rating acquisition on revisions of the filling price.

	Standard & Poor's			Moody's			Fitch		
VARIABLES	OLS	Heckman	IV-2SLS	OLS	Heckman	IV-2SLS	OLS	Heckman	IV-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
S&P	-4.58***	-10.34***	-5.21**						
	(1.26)	(2.2)	(3.6)						
Moody's				-5. 28***	-12.32***	-6.16**			
				(1.06)	(2.09)	(3.39)			
Fitch							-7.44**	-14.19***	-6.17***
							(3.4)	(4.07)	(2.22)
Overhang	0.55***	0.56***	0.55***	0.55***	0.54***	0.57***	0.57***	0.48***	0.38***
	(0.12)	(0.11)	(0.14)	(0.11)	(0.14)	(0.12)	(0.12)	(0.12)	(0.11)
Venture Cap.	4.81***	4.82***	4.83***	4.81***	4.84***	4.66***	4.11***	4.09***	4.98***
	(0.77)	(0.81)	(0.82)	(0.73)	(0.78)	(0.52)	(0.73)	(0.81)	(0.65)
Underwriter	1.49	1.6	1.68	1.52	1.59	1.6	1.36	1.32	-3.04**
	(1.36)	(1.19)	(1.21)	(1.36)	(1.19)	(1.21)	(1.37)	(1.19)	(1.34)
Auditor Rep.	-2.68***	-2.61***	-2.54***	-2.65***	-2.61***	-2.55***	-2.83***	-2.82***	-0.54
	(0.95)	(0.88)	(0.9)	(0.93)	(0.89)	(0.9)	(0.94)	(0.89)	(0.9)
Exchange	0.49	0.12	0.32	0.41	0.06	0.28	0.6	0.49	0.03
	(0.85)	(0.9)	(0.91)	(0.86)	(0.9)	(0.92)	(0.85)	(0.9)	(0.8)
Prim. Shares	-0.07	0.15	0.02	-0.07	0.24	-0.01	-0.16	0.03	-2.73***
	(0.84)	(0.9)	(0.91)	(0.85)	(0.91)	(0.91)	(0.85)	(0.9)	(0.81)
Revision	4.48***	4.89***	4.63***	4.5***	4.87***	4.61***	4.36***	4.51***	2.27***
	(0.57)	(0.51)	(0.52)	(0.596)	(0.51)	(0.52)	(0.58)	(0.5)	(0.51)
Log Proceeds	0.21	0.56	0.3	0.29	0.7	0.39	0.18	0.427	0.64
	(0.52)	(0.56)	(0.55)	(0.52)	(0.5)	(0.56)	(0.52)	(0.56)	(0.5)
Log Sales	-1.22***	-1.11**	-1.13**	-1.23***	-1.12**	-1.18***	-1.26***	-1.23***	-1.13***
	(0.35)	(0.45)	(0.45)	(0.35)	(0.44)	(0.45)	(0.35)	(0.44)	(0.34)
Log Age	-1.58	-1.62	-1.66	-1.59	-1.61	-1.71	-1.47	-1.44	-2.08**
	(1.16)	(1.21)	(1.32)	(1.33)	(1.18)	(1.29)	(1.38)	(1.22)	(1.29)
Constant	-67.48***	-72.12***	-72.44***	-63.47***	-73.71***	-72.72***	-79.54***	-73.12***	-56.49***
	(8.12)	(7.09)	(7.57)	(8.28)	(8.11)	(8.05)	(11.25)	(8.11)	(7.16)
N	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541
Adjusted-R^2	0.12	-	-	0.12	-	-	0.11	-	-

Panel B: Effect of multiple credit rating acquisition on revisions of the filling price.

		Standard & Poor's-Moody's		Standard & Poor's-Fitch		Moody's-Fitch				Standard & Poor's-Moody's-Fitch		
VARIABLES	OLS	Heckman	IV-2SLS	OLS	Heckman	IV-2SLS	OLS	Heckman	IV-2SLS	OLS	Heckman	IV-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
S&P, Moody's	-5.59***	-10.97***	-12.01***									
	(1.21)	(2.33)	(1.77)									
S&P, Fitch				-1.99**	-14.12***	-10.14***						
				(0.12)	(4.06)	(2.88)						
Moody's Fitch							-4.57**	-14.43***	-10.24***			
							(1.58)	(4.06)	(2.25)			
Triple Rating										-4.62**	-14.91***	-9.22***
										(1.35)	(4.42)	(2.05)
Overhang	0.48***	0.47***	0.36***	0.48	0.47***	0.37***	0.46***	0.47***	0.38***	0.48***	0.46***	0.38***
	(0.12)	(0.11)	(0.11)	(0.12)	(0.12)	(0.11)	(0.13)	(0.12)	(0.08)	(0.12)	(0.11)	(0.11)
Venture Cap.	2.88***	2.79***	3.41***	3.12*	3.85***	3.66***	3.02***	3.83***	3.48***	2.05***	2.85***	3.56***
	(0.56)	(0.54)	(0.57)	(0.49)	(0.85)	(0.81)	(0.79)	(0.89)	(0.84)	(0.83)	(0.88)	(0.76)
Underwriter	1.52	1.6	-2.08	1.344**	1.49	-2.48*	1.42	1.55	-2.5*	1.4	1.53	-2.59*
	(1.37)	(1.2)	(1.37)	(0.05)	(1.19)	(1.36)	(1.3)	(1.19)	(1.35)	(1.37)	(1.19)	(1.35)
Auditor Rep.	-2.7***	-2.63***	0.01	-2.7	-2.71***	-0.23	-2.72***	-2.65***	-0.2	-2.73***	-2.65***	-0.2
	(0.93)	(0.89)	(0.9)	(0.58)	(0.88)	(0.9)	(0.9)	(0.8)	(0.8)	(0.94)	(0.89)	(0.9)
Exchange	0.48	0.2	-1.2	0.63	0.34	-0.61	0.59	0.35	-0.4	0.6	0.38	-0.4
	(0.86)	(0.9)	(0.88)	(0.5)	(0.89)	(0.86)	(0.85)	(0.89)	(0.8)	(0.86)	(0.89)	(0.85)
Prim.Shares	-0.18	0.05	-2.9***	-0.19	0.05	-2.8***	-0.19	0.03	-2.84***	-0.2	-0.01	-2.8***
	(0.85)	(0.9)	(0.82)	(0.09)	(0.9)	(0.82)	(0.85)	(0.9)	(0.82)	(0.85)	(0.9)	(0.8)
Revision	4.4***	4.7***	2.56***	4.33**	4.63***	2.46***	4.37***	4.61***	2.43***	4.35***	4.54***	2.41***
	(0.59)	(0.5)	(0.5)	(0.2)	(0.51)	(0.53)	(0.5)	(0.5)	(0.5)	(0.59)	(0.5)	(0.5)
Log Proceeds	0.23	0.5	1.04**	0.13	0.43	0.78	0.1	0.41	0.79	0.15	0.4	0.8
	(0.52)	(0.5)	(0.5)	(0.27)	(0.56)	(0.58)	(0.5)	(0.55)	(0.51)	(0.52)	(0.56)	(0.56)
Log Sales	-1.26***	-1.17***	-1.07***	-1.31**	-1.2***	-1.135***	-1.29***	-1.22***	-1.21***	-1.29***	-1.23***	-1.21***
	(0.35)	(0.4)	(0.3)	(0.04)	(0.44)	(0.34)	(0.35)	(0.46)	(0.34)	(0.35)	(0.46)	(0.3)
Log Age	-1.21	-1.18	-1.01	-1.04	-1.33	-1.78	-1.08	-1.44	-1.24	-1.31	-1.43	-1.32
	(1.37)	(1.2)	(1.37)	(1.05)	(1.19)	(1.36)	(1.9)	(1.22)	(1.24)	(1.03)	(1.01)	(1.05)
Constant	-71.52***	-76.48***	-54.62***	-79.66**	-76.29***	-52.92***	-80.11***	-87.31***	-52.27***	-83.1***	-81.4***	-39.59***
	(9.71)	(8.31)	(8.73)	(4.21)	(8.18)	(8.57)	(9.73)	(8.12)	(8.33)	(9.69)	(8.26)	(8.55)
N	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541
Adjusted-R^2	0.1	-	-	0.1	-		0.1	-	-	0.1	-	-

Table 10: Investment grade ratings and IPO pricing

The table reports output on the effect of investment grade ratings on the level of initial returns. Our main independent variable is a categorical indicator assuming the value of one for investment grade firms and zero otherwise. In specification (1) InvestGrd is regressed against underpricing in matched sample of rated US IPOs. In specification (2), we follow the same procedure for our entire sample. To account for endogeneity we employ a Heckman treatment effects model. The list of instruments used in models 2 and 3 as well as the definition of the control variables are provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

VARIABLES	Matched-Sample Heckman (1)	Full-Sample Heckman (2)
InvestGrd	-3.76**	-10.53***
	(0.68)	(3.22)
Overhang	0.92**	1.78***
	(0.21)	(0.43)
Venture Capital	14.8***	15.87***
	(1.02)	(1.71)
Underwriter	-1.45	5.71***
	(6.04)	(1.1)
Auditor Reputation	1.7	-0.63
	(2.9)	(2.11)
Exchange	9.12	1.88
	(3.95)	(1.9)
Log Sales	0.24	-1.97*
	(2.25)	(1.14)
Primary Shares	3.62	5.4***
	(4.39)	(1.6)
Revisions	0.4	1.15***
	(0.25)	(0.14)
Log Proceeds	2.74**	3.54***
	(0.73)	(1.17)
Log Age	-1.05	0.59
	(0.87)	(0.62)
Constant	-56.32**	-74.43***
	(10.34)	(19.16)
N	252	2,541
Pseudo-R^2	0.39	0.41

Table 11: Effect of multiple credit ratings on Tobin's Q

The table reports results on the effect of all possible CRA combinations on Tobin's Q for a sample of 2,541 US IPOs over the period 1997-2014. The econometric methods employed are: OLS and generated instrumental variables (2SLS) approach. The list of instruments used as well as the definition of the control variables is provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

	Tobin's Q S&P, Moody's		Tobin's Q S&P, Fitch		Tobin's Q Moody's, Fitch		Tobin's Q S&P, Moody's, Fitch	
VARIABLES	OLS	IV-2SLS	OLS	IV-2SLS	OLS	IV-2SLS	OLS	IV-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
S&P, Moody's	5.08***	5.32***						
	(2.2)	(2.8)						
S&P, Fitch			4.71***	7.53***				
			(1.8)	(2.4)				
Moody's, Fitch					4.72***	6.75***		
					(1.6)	(2.1)		
S&P, Moody's, Fitch							4.54***	6.95***
							(0.72)	(2.11)
Overhang	-0.81	1.07**	-0.85	1.06**	-0.82	0.97*	-0.91	0.92*
	(1.77)	(0.45)	(1.15)	(0.43)	(1.62)	(0.54)	(1.66)	(0.52)
Venture Capital	-2.43*	-5.68**	-4.91*	-5.81**	-3.84*	-5.44**	-3.82*	-4.03*
	(2.03)	(2.09)	(2.06)	(2.02)	(2.87)	(2.03)	(2.12)	(2.74)
Underwriter	-5.51	-2.17	-5.56	-4.31	-5.67	-4.22	-5.4	-3.03
	(1.04)	(1.73)	(4.9)	(5.12)	(2.9)	(5.2)	(1.9)	(0.06)
Auditor Reput.	5.91	3.94	5.67	3.16	5.91	2.5	5.77	3.07
	(1.7)	(0.93)	(1.73)	(0.4)	(1.7)	(1.6)	(1.74)	(4.5)
Exchange	-1.11	-3.96	-1.83	-3.72	-2.06	-3.74	-2.1	-4.33
	(1.08)	(0.53)	(1.05)	(0.01)	(1.2)	(1.01)	(1.9)	(5.9)
Revisions	0.02	-0.04	-0.01	-0.07	-0.01	-0.04	-0.01	-0.05
	(0.12)	(0.06)	(0.11)	(0.06)	(0.12)	(0.06)	(0.12)	(0.06)
Primary Shares	6.14	0.55	6.13	0.47	6.27	0.74	6.3	0.74
	(4.91)	(1.63)	(4.93)	(1.75)	(4.94)	(1.76)	(4.95)	(1.76)
Log Sales	-2.91***	-1.72***	-2.12***	-1.4***	-2.18***	-1.38***	-2.17***	-1.27***
	(2.09)	(1.54)	(6.71)	(0.32)	(1.33)	(1.35)	(1.07)	(1.03)
Log Proceeds	7.99	5.89***	8.73	5.97***	8.66	6.1***	8.9	6.24***
	(1.86)	(2.17)	(1.91)	(0.28)	(0.9)	(1.25)	(0.93)	(1.28)
Log Age	-1.39	0.62	-1.28	-0.29	-1.18	0.05	-1.12	0.29
	(11.52)	(1.01)	(11.54)	(1.18)	(11.51)	(1.21)	(11.50)	(1.2)
Constant	9.24		-4.78		-2.34		-7.12	-6.86
	(2.13)		(2.99)		(2.11)		(2.86)	(1.23)
N	2,541		2,541		2,541		2,541	2,541
Adjusted-R^2	0.12	-	0.12	-	0.12	-	0.12	-

Table 12: Impact of CRA combinations on investor valuations

The table reports results on the effect of all possible CRA combinations on investor valuation for a sample of 1,533 US IPOs over the period 2000-2013. The econometric method employed is Heckman treatment effects model. The list of instruments used as well as the definition of the control variables is provided in the Appendix. One asterisk denotes significance at the 10% level, two denote significance at the 5% level and three denote significance at the 1% level.

VARIABLES	S&P, MDY Heckman (1)	S&P,Fitch Heckman (2)	MDY, Fitch Heckman (3)	S&P, MDY, Fitch Heckman (4)
S&P, Moody's	4.46***			
	(1.51)			
S&P, Fitch		5.62***		
		(2.32)		
Moody's, Fitch			7.82***	
			(1.23)	
S&P, MDY, Fitch				8.56***
				(2.55)
Overhang	-0.05	-0.07	-0.15	-0.16
	(0.16)	(0.11)	(0.16)	(0.14)
Venture Capital	-0.47	-0.38	-0.13	-0.21
	(0.73)	(0.86)	(0.82)	(1.09)
Underwriter	-1.4	-1.5	-1.88	-1.45
	(1.5)	(1.6)	(1.62)	(1.62)
Auditor Reputation	-0.41	-1.04	-1.32	-1.27
	(1.05)	(1.09)	(1.09)	(1.1)
Exchange	0.82	1.02	0.7	0.66
	(1.27)	(1.37)	(1.28)	(1.34)
Revisions	0.01	-0.01	0.01	0.01
	(0.04)	(0.04)	(0.04)	(0.04)
Primary Shares	3.6 *	3.2	3.73*	3.4*
	(2.03)	(1.5)	(2.02)	(2.04)
Log Sales	0.29	0.6	0.73	0.58
	(0.6)	(0.73)	(0.72)	(0.73)
Log Proceeds	0.96	1.25	0.8	1.37
	(1.2)	(1.8)	(1.82)	(1.79)
Log Age	0.16	-0.17	-0.02	0.01
	(0.51)	(0.59)	(0.52)	(0.56)
Constant	-18.45	-22.87	-18.19	-25.18
	(11.59)	(11.15)	(4.11)	(12.48)
N	2,541	2,541	2,541	2,541
Adjusted-R^2	0.11	0.11	0.12	0.11

Chapter 5 - Earnings Management of Politically Connected Issuers

5.1 Introduction

This study explores the association between political money contributions (PMC) of US IPO firms and earnings management (EM). Arguably, reported earnings constitute an imperative aspect of corporate performance which assists financiers to value stocks. Accordingly, top-echelon management has a sturdy stimulus to maneuver income in order to drive immediate share prices upwards. Executives' motivation to treat profits favorably is even stronger before an imminent new equity issue as a result of asymmetric information between company insiders and outside market participants.

A plethora of relevant studies scrutinize EM practices by IPO entities and establish empirical proof on opportunistic income enhancing behavior around the first trading day. This puts forward the pertinent inability of uniformed investors to effectively fiddle with handling of earnings (Aharony et al. 1993, Friedlan 1994, Teoh et al. 1998a, Teoh et al. 1998b and DuChrame et al. 2004). Literature in accounting conjectures that the incentives of directors to stage-manage income could be enhanced in the absence of specific parties like top tier investment bankers, audit committees, non-executive directors and venture capitalists (Becker et al. 1998, Klein 2002, Morsfield and Tan 2006 and Lee and Masulis 2011). Yet, the way political money disbursements affect EM tactics in newly firms remains a relatively unexplored area of research.

Establishing or enhancing political connections is generally regarded as value increasing policy in the corporate world. Proliferate authors on this field posit that connected companies normally receive benefits from this activity that far exceed the costs they have to incur. In particular, it is well documented that businesses with political ties are able to retain superior market shares, enjoy privileged right of entry to credit sources and are less likely to be disciplined for constantly conveying subpar performance (Faccio 2006, Boubakri et al. 2008, Chen et al. 2010, Cooper et al. 2010 and Chaney et al. 2011). Nonetheless, it is startling that no previous study has focused on PMC choice as a strategy that enables firms to opportunistically undertake income increasing reporting methods.

Motivated by the sizeable effect of connections on various aspects of firm performance and lack of evidence on the association between PMC and EM around the time of a new equity issue; we seek to explain whether earnings accuracy systematically

differs for politically connected IPOs. In an important divergence from previous research (Cooper et al. 2010, Ramanna and Roychowdhury 2010, Yu and Yu 2010) which concentrates on latent gains accruing to listed corporations that maintain ties with key political bodies, we investigate possible benefits this strategy entails for prospective issuers. Intuitively, the establishment of connections could render confidence to managers that their companies are less likely to be disciplined for not reporting precise income estimates. Thus, the incentive to manipulate earnings in order to make the offering more attractive to potential investors becomes stronger.

To effectively cope with this consideration we amass a comprehensive sample of IPOs that floated the US stock exchanges from 1 January, 1998 to 31 December, 2014. Manually, we inspect each individual company in the electronic records of the American Federal Election Committee (FEC) for proof of political contributions in a five year period prior to the first day of trade. This way we end up with our special sample of interest, PMC-IPOs. To set up an inclusive analysis of earnings handling schemes by new equity firms we probe two EM techniques: a) accrual focused EM that entails exploitation of accounting judgment about acknowledgement of accruals and b) real EM that requires shifting the time or configuration of real activities.

Methodologically, we place special attention on our empirical approach to depict conclusions that are not crippled by feedback effects. Taking into account the decidedly optional character of political contributions, it is possible that company explicit attributes influencing the PMC choice also affect EM practices. To control for endogeneity we instrument for connections through a set of customary determinants of PMC whereas we also bring in original ones, particularly, customized to the IPO framework. The outcome and selection equations are estimated in a two stage process following instrumental variables (IV) and Heckman-treatment effects models. The later method tackles self-selection bias arising from the fact that the decision to establish a PMC record is inherently determined by top managers. The first method instruments via fitted values and strengthens the validity of our assortment of PMC contributors. To further test the robustness of our empirical findings we simultaneously estimate the outcome and selection specifications by means of maximum likelihood (MLE). Consistently, results hold across all econometric approaches.

Our main result is that newly listed PMC firms are more prone to handle accruals as well as real operating activities in order to inflate reported income. Also, the actual level of both PAC and lobbying disbursements positively relates to the extent of EM

undertaken by prospective issuers. This suggests that corporations donating money to politics capitalize benefits from their connections as they become opaque in their earnings reporting practices. The opposite is true for the non-connected sample companies.

This study makes important contributions to existing literature. Previous research on new equity issues provides support to the notion that managers treat profits favourably prior to the offering to mislead investors (Aharony et al. 1993, Friedlan 1994, Teoh et al. 1998a, Teoh et al. 1998b, Roosenbloom and Van De Goot 2003, DuCharme et al.2004) and points out that in the absence of financial mediators such as top-tier underwriters and venture capitalists, EM exacerbates (Morsfield and Tan 2006, Lee and Masulis 2011, Hochberg 2012, Wongsunwai 2013). To our knowledge no previous research has been conducted to explicitly scrutinize the effect of PMC on EM around the time of the initial offering. Based on a hand-collected dataset of US IPOs, we establish novel empirical proof to the conjecture that politically connected entities are less responsive to investors' demand for accurate estimation of earnings. Our results entail essential repercussions for practitioners as well. The evidence we present is particularly useful for controllers and supervisory bodies that are interested to appraise the meticulousness of reporting practices by PMC-issuers. For potential investors our empirical output can be a signal of caution that connections lessen top-management's hesitation to manipulate earnings so as to facilitate a successful IPO.

The remainder of this research is structured as follows: Section II discusses the relevant literature, Section III describes the data collection process, Section IV offers preliminary data analysis and contrasts PMC types, Section V explains the EM estimation techniques, Section VI explains the methodology, Section VII presents the empirical output and Section VIII concludes the study.

5.2 Review of literature

5.2.1. Earnings Management around new equity offerings

The price setting process for new equity issues develops in an intrinsically uncertain milieu. Due to the absence of previous public market for the offering, firm outsiders face a scarcity of unswerving financial information upon which investment decisions rely (Cheung and Krinsky 1994; Balatbat 2006; Brazel et al 2006). Inevitably, information asymmetries between principals (perspective shareholders) and agents

(executives) could trigger potential conflicts of interest. At their seminal work, Jensen and Meckling (1976), introduce agency theory to depict the problematic phenomena of adverse selection and moral hazard. The former refers to instances where only managers maintain the right to use private information essential to decision making. The later refers to opportunistic courses of action, taken by executives, that are clearly unknown and against the interest of the owners.

As the company goes public, financiers are under the burden of informational disadvantage and seek ways to tackle concerns on firm quality. To this end they depend on IPO prospectuses that usually contain financial statements (quarterly and annually) of the three previous years. The accounting information which can be extracted by these documents is of vital importance. Habitually, investment banks draw on price earnings industry ratios as well as the issuing firm's current earnings to facilitate the pricing of the new offer. Correspondingly, equity analysts carry out investment counseling based on reported earnings of the newly listed entity (Lee and Masulis 2011). In this fashion, prospectus accounting figures constitute a source of knowledge on scale, timeliness and risk of projectedcash flows to third parties (Fields et al. 2001). However, the capability of issuers to exercise substantial discretion in fulfilling their reporting requirements; provokes grim suspicions for possible opportunistic behavior. Self-regarding executives of privately owned companies have compelling interest to stage-manage earnings prior to the listing in an attempt to boost the stock price upwards. This practice which is commonly termed as earnings management (EM) could simultaneously drive up issue prices and augment the likelihood of successful IPO launching with larger amount of shares sold. Additionally, this modus operandi could also persist at the direct post IPO stage. Lock up constraints on share selling by executives in conjunction with the peril of prospect legal action against the firm for nonstandard decline of stock value, induces the continuation of handling earnings aloft to sustain high share price at the end of the issue year (Teoh et al. 1998).

Studies scrutinizing the practice of EM at the time of IPO focus on how top-management uses accruals during the going public phase and systematically report intentional handling by the issuers. Aharony et al (1993), present first evidence of such manipulation by firm executives before the actual listing takes place. Friedlan (1994), also, documents income boosting accrual irregularities for the same time interlude. Conspicuously, Teoh et al. (1998b) take this analysis one step further to establish an inverse relation between abnormal accruals and projected earnings revealing conciliatory

earnings determination around the offering. Additionally, Teoh et al. (1998a), ascertain that this type of EM practice associates with lower long run IPO returns. This is in accordance with the view that the short term benefits stemming from inflated offer prices can induce idiosyncratic managerial behavior invisible to potential investors. Substantial amount of relevant research supports as well the notion of insistent accrual usage by executives around the new issue day (DuCharme 2001, Roosenboom et al 2003, DuCharme 2004 and Marquardt and Wiedman 2004). Interestingly, Ball and Shivakumar (2008), contest this line of reasoning on the grounds that IPOs generate great deal of media coverage and capture the attention of parties which eventually assume facilitating role in the going public process (financial analysts, policy makers, auditors and perspective investors). Consequently, they claim that new issuers confront strong demand for production of highly accurate financial statements. Investigating a sample of previously private British corporations which filed reports akin to US IPO prospectuses; they evidence that these entities apply a more conservative reporting approach. Arguably, this could constitute a rational response to the market player's quest for superior quality accounting information. Conversely, Lo (2008) confutes this argument stating that more experienced executives are prone to deliver incomparable reports where the exploitation of earnings is less visible. As a result, the sample of Ball and Shivakumar appears vulnerable to self-selection bias and probably leaves out newly listed companies that are actually susceptible to EM practices. Hence, the conjecture of no artificially inflated earnings by the issuer may well lose validity.

Apart from the accrual stipulated earnings handling schemes, relevant literature lays growing attention on real EM as an alternate means of earnings manipulation. Contrary to accruals' usage (always under the framework of the generally accepted accounting principles) so as to positively bias reported income; real EM materializes once executives intentionally modify the structure or timelines of actual financing, operating and investment pronouncements to accomplish advantageous pecuniary reporting outcomes. The former leaves cash flows unchanged as it utterly depends on the selection of appropriate accounting techniques that will be employed to identify financial transactions. The later, on the other hand, influences operating activities and through them cash flows. Managers encounter an array of different motives that make real EM preferable to the accrual treatment approach. Initially, earnings manipulation by means of real activity is certainly less visible to auditors as well as regulatory authorities and thus relatively immune to further scrutiny (Graham et al 2005, Roychowdhury 2006 and

Cohen et al. 2008). In addition, counting entirely on exploitation of accruals to reach the targeted earnings level can be a dicey strategy. Given that this type of EM only occurs towards the end of the fiscal year, if the amount of earnings that needs to be managed fails to overtake the chosen threshold, executives cannot fine-tune real activity by that time (Cohen and Zarowin 2010, Gunny 2010). As Zang (2012) affirms, directors amend the extent of accrual-focused EM at year end, in accordance to the magnitude of real activity usage over this time period. Also, it is well known that balance sheets amass outcomes of precedent accounting decisions. Hence, it becomes evident that extensive accrual treatment in the past inversely relates to manager's capacity to predispose earnings opportunistically (Gunny 2010).

Although the use of accruals to manage earnings in the period surrounding the new offer is well documented in literature, real earnings management at the same time interval is a relatively under-researched area. Yet, Graham et al (2005) survey a sample of 400 directors and document that executives prefer not to engage in EM via accounting strategies under GAAP. As an alternative, they handle real activity to achieve the desired reporting results. To assist the realization of income targets, about 80% of the survey participants settle on reducing unrestricted expenses on advertising, research and development and maintenance. Moreover, 55% chooses to setback new ventures even if such postponement might marginally shrink company worth. In this direction, Darrough and Rangan (2005) argue that new issuers tend to positively bias earnings during the year of the offering through R&D expense contraction. Correspondingly, Roychowdury (2006), states that real EM tactics can conceal annual loss recognition in various methods. First, executives could tender price markdowns over and above moderate credit provisions to increase sales. Then there is the possibility of operating margin boost up by means of incremental production. This way, overheads are apportioned to augmented inventory levels and as a result the costs of goods sold declines. By the same token, cutbacks of discretionary outflows like research and development, advertising and selling general and administrative expenditures lead to inflated earnings. Cohen and Zarowin (2010) verify that real EM schemes also have effect on seasoned equity offerings (SEOs) as they result in poor operating performance in the after SEO time interlude. This effect is much less manifested in cases where managers follow accrual based handling approach. Alhadab (2014), clarifies that new issuers in UK fit into place both of the aforementioned EM practices during the listing year to overplay earnings. The same study documents

high chances of a subsequent IPO failure and low survival rates for the those firms that associate with large scale income usage.

Prospects for extra treatment of earnings could augment in the presence of lenient auditors who might be involved in the issuing process as well as via safeguarding tolerant monitoring manners by policy makers and outside participants. Scholars focusing on EM at the interlude around the offering seek to establish evidence on the effect external IPO contributors exert on EM schemes imposed by the issuers. Findings suggest that strict venture capital monitoring inversely relates to any type of income manipulation by the firm managers (Morsfield and Tan 2006, Hochberg 2012 and Wongsunwai 2013). Lee and Masulis (2011) take this line of reasoning one step further to confirm that EM methods are more prevalent in newly listed corporations which do not rely upon the most prestigious underwriters. Yet, someone could argue that besides private third parties (i.e. investment banks and auditing firms) the level of scrutiny regulators levy on IPO entities, may well influence directors' attitude towards the quality of reported earnings. The way political connections interrelate to EM tactics remains a relatively unexplored area in accounting literature.

5.2.2 Company value enhancement via political money donations

The corporate wealth amassing element of political contributions is investigated by scholars through two pivotal ways. The first one involves identification of firm insiders' association to politics and the second one employs a 'follow the money' method which estimates the amount of money that is bound for political related issues.

In a worldwide and cross-national setting, reduced availability of trustworthy data along with deliberately cloudy relationships among private institutions and local regimes force researchers to an unswerving examination of each executive separately. In such instances corporations are thought to obtain ties with the government via managers who energetically participate in politically related activities or by maintaining close connections with persons who do. Following this method, Faccio (2006) in a proportional study of 47 nations, suggests that firms with political capital retain higher market share even as this gain might not eventually be mirrored on the entity's balance sheet (likewise see Boubakri et al. 2008). The same research also reports that companies with political allies are able to take on much larger amounts of leverage without endangering their financial viability. Thus, connected for profit entities relish privileged admittance to debt

provision (i.e. through moderate credit terms) although there is no profound substantiation on why they should sustain lower interest rates weighs in opposition to non-connected rivals. Further, Chaney et al (2011) evaluate the financial statement accuracy of about 4,500 corporations in 19 countries and present empirical proof that firms with political alliances are unlikely to be disciplined for constantly conveying less precise information. Evidently, under the presence of governmental ties, reporting quality diminishes in relative importance. As Chaney et al (2009) reveal the existence of connections enhances management's reluctance to fully comply with market quests for highest possible accuracy.

Identifying US executives with a direct relation to politics in a parallel manner to previous research is a dubious task. Following this approach, Faccio (2006) scrutinized a sample of more than 6,000 companies only to find 13 firms to be recorded as politically allied. Literature focusing on the US dodges this constraint via enlarging the notion of political capital to include corporate outflows for any function which relates to politics. That type of expenditure comes foremost either from PAC or lobbying donations. Under this setting, Cooper et al (2010) along with Chen et al (2010) correspondingly focus on PAC donations and lobby outlays and ultimately reach a consensus; money spent on connections habitually associate with better financial performance. Apart from superior returns, company cash endowments to political pockets are also found to assist debatable purposes. In particular, Correira (2012) concludes both types of the aforementioned contributions significantly reduce the chance of SEC disciplinary acts against the connected entity. Interestingly, the same study finds that even when the corporation faces regulatory enforcement the sentence is anticipated to be much less harsh. Similarly, Yu and Yu (2010) augment the invulnerability to accounting scams generated by political disbursements: "entities which engage in lobbying overall contain a considerably lesser hazard pace of being spotted of scheme, avoid scam uncovering approximately 117 days longer and are 38% less probable to be noticed by policy makers".

5.3 Sample and Data

To amass our data we gather information from the Securities Data Company (SDC) for a time interlude that extends from January 1st, 1998 to December 31st 2014. We retrieve the full population of new equity issues that floated the US stock exchanges over this period. Relying on pertinent studies (i.e. Loughran and Ritter, 2002) we rule out offerings priced below 5 dollars per share, American depository receipts, limited partnerships, reverse leveraged buyouts and also non-US listings whose stock already trades in confined markets. Furthermore, although we make allowances for financial companies we are mostly alert to chuck out royalty trusts, special purpose investment vehicles, closed end funds and real estate investment trusts. For that reason, we exclude corporations obtaining SIC codes amid 6723 and 6999 in addition to firms which albeit sidestep Thompson One restraints for closed end fund, still function as such. Finally, we leave out corporate spin offs as these entities typically constitute divisions of bigger, established businesses and so they leave considerably less money on the table compare to the IPO average. The rest of the sample is completed by intergrading information both from the Center for Research and Security Prices (CRSP) and Compustat. From there we collect all accounting variables for our sample companies. After the imposition of all exclusion criteria we end up with a dataset that contains 2,104 new offerings.

B. The two measures of political money contributions (PMC): PAC and Lobbying

Political action committees (PAC) and lobbying endowments make up two focal channels through which American companies can get in touch with Congress assembly rooms. The choice to direct corporate funds in either of type of PMC lies exclusively to firm executives. We probe cash outflows to politics by new issuers in a five year interlude prior to the first trading day. In due course, this approach leads to a special sample of 286 IPOs with a record of political donations.

PAC expenditures exclusively endeavor to prop up or contest the campaign of a candidate and thus are normally established amidst election cycle stages. The corporation’s top echelon managers are entitled to allow for this type of operational expenses but cannot offer extra support. Endowments have to come from other company related individuals and as a rule they are people with an essential role in the firm (i.e. stockholders, employees etc). Since PAC contributions are easily traceable, they represent the most commonly employed measure of political ties in the US (Milyo et al 2000). We retrieve data on PAC donations from the Federal Elections Commission (FEC)

web records. To accentuate the superior intelligibility of PAC contributions weigh against lobbying, we manually investigate the "Contributions to candidates from committees" and the "Candidate Master" archives for all IPO companies in our sample. Our ultimate aspiration is to confine not only the timing of PAC but also meticulous outlines of cash beneficiaries (i.e. house affiliation, party membership, state origin etc). This enquiry results in 96 newly listed entities that have authorized PAC expenditures.

Lobbying constitutes a prime channel through which US firms establish connections with Congress chambers. Regarding both its scale and rate of recurrence, lobby money forms the most popular type of PMC (de Figueiredo and Richter 2014). The rationale behind spending money for this type of political endowment has to do with the corporation's perception about the institutional structure in which the entity functions. Instead of appealing explicitly to politicians, lobbying expenses refer to the fundamental nature of policy creation as such. Given that cash outflows for lobbying do not go into contenders' campaign casket, this disbursement turns out to be a hazy measure of political connectedness perceptible down to the individual echelon. For instance, the disclosure file which reports lobbying payments briefly states that the company lobbied the US Senate and/or the House of Representatives. However, the total sum of the donation (that should be unveiled by the 1995 Act of Lobbying Disclosure) verifies the extent of firm's engagement to politics. For lobbying outlay information we retrieve data from the archives of the 'center of responsive politics' (CRP). This research organization obtains its requisite parameters straight from the six month lobbying exposure documents reported to the Secretary of the Senate's office of public records and commences scrutinization of business lobbying in 1998. Combining the CRP dataset with our sample's new equity offerings we spot 258 IPO deals that have repetitively fit lobbying into place.

5.4 Descriptive Statistics

In table 1, we offer a preliminary portrayal of our complete sample (N=2,104) of newly listed firms with reference to subsamples of companies with (N=286) and without (N=1,818) an established record of political money contributions. First, we display IPOs according to the dissections of the Standard Industrial Classification (SIC) codes which are used by the Securities Exchange Committee (SEC). The majority of connected corporations fit in the manufacturing division (34.61%) tailed by the service industries

category (25.87%) and finance, real estate and insurance classification (15.03%). This upshot seems reasonable considering the substantial regulatory outline that companies belonging to these three categories have to follow. In contrast, categories coming into contact with negligible by-laws unveil higher stinginess on PMC engagement (e.g. the agriculture, forestry and fishing sector represents just the 0.35% of firms which contribute cash to political coffers). Extemporaneously, it is plausible to argue that entities more exposed to the legislative agenda would be prone to establish connections with Congress chambers.

With respect to issuer characteristics, we document that it takes 17.06 years for a typical company in the sample to go public. Also, the average IPO-firm has a mean market value of $548.2 million and generates proceeds of $86.16 million. Further, we observe that the somewhat younger newly listed entities engage more keenly on PMC activities. This finding may suggest that less experienced businesses could be more vulnerable to legislative risk and perceive political ties as a potential shield against this peril. Finally, this preliminary analysis makes clear that spending for connections is a practice that customarily associates with corporations which are larger both in terms of total assets and sales revenue. Less cash affluent corporations direct smaller amount of funds to political pockets.

Table 2, elucidates descriptive analysis of earnings management measures as well as company attributes for the new equity issues included in our sample. In particular, we report average and median values along with levels of significance for all IPOs in addition to two subcategories with connected and non-connected offerings. Besides the time elapsed from the firm's incorporation to the first day of trade and the company market value that were addressed above, results show that a usual IPO in our sample maintains an average leverage ratio of 0.82 and an average ROA (industry-accustomed) of 0.18. The typical newly listed entity incurs a mean loss of 39% in the year preceding the offering and its ratio of capital expenditures to total assets is approximately 43%. On the whole, 37% of the firms rely on prestigious underwriters to facilitate the going public process, 95% hire one of the six largest accounting firms to audit their financial statements and finally 52% have venture capital backing.

Company explicit attributes also seem to vary among PMC and non-PMC IPOs. The differences in means are highly significant for all corporation specific traits apart from capital expenditures. Connected issuers undertake larger amounts of debt than their non-connected counterparts. In particular, the average ratio of total liabilities to total

assets for PMC companies is 99% and 71% for those without an established PMC record. Additionally, we find that 40% of firms that take on lobby and PAC activities declare losses one year before the first trading day whilst the same holds true just for the 9% of entities without any donations to candidates or political parties. Moreover, PMC-IPOs exhibit better ROA (industry-accustomed) compare to the non-PMC sample and on average they rely less on prestigious underwriters (35%). On the other hand, entities without any spending on politics tend to hire prominent investment bankers at a much higher rate (the mean value is 69%). Similarly, connected firms on average rely less on big audit firms (92%) and venture capitalists (19%). The biggest six audit firms provide their services to the 96% of non PMC IPOs and 56% of these new equity issues are VC backed.

With regard to earnings management measures, we hinge on medians for statistical inferences as they are less prone to be influenced by outliers. Findings on the full sample show that the median value of non-standard accruals (0.03) is bigger than zero at the 1% level of confidence. This outcome aligns with evidence from relevant literature suggesting that new issues are predisposed to stage-manage accruals in order to inflate earnings. The same conclusion holds true for non-standard operating cash flows that exhibit a value of 0.04. Interestingly, we document that the medians of non-standard costs of production (-0.09), non-standard provisional expenses (-0.32), REMGT-1 (-0.33) and REMGT-2 (-0.24) are negative. This suggests that IPO companies fit into place income enhancing real earnings management schemes by treatment of sales and not by excess production or discretionary expenses. With respect to our subsamples of PMC and non PMC-firms, preliminary analysis confirms that politically connected corporations have strongly significant and positive median values for non-standard accruals (0.02) as well as for non-standard operating cash flows (0.02). On the contrary, for non-connected entities all EM proxies (with the exception of REMGT-1) are not statistically different from zero.

5.5 Methods for earnings management approximation

5.5.1 Accrual stipulated EM

To determine abnormal accrual estimations we rely on the modified Jones model (1991) as Dechow et al (1995) depict it. Earnings management research, heavily hinges on this formula ever since its introduction. Thus, it is of no surprise that numerous contemporary studies use it to quantify nonstandard accruals (Doukakis 2014, Ye 2014 and Franz et al 2014). In his seminal work Jones (1991), presumes that changes in sales along with property, plant and equipment (PPE) constitute two major factors of an enterprise's accruals. Consequently, the overall accrual level is a function of these parameters. This overall amount ultimately disaggregates in two gears: nonstandard and projected accruals. The later one mirrors the firm's financial standing and is forecasted by the alterations of PPE in conjunction with sales. The former one echoes management's judgment and is estimated by means of residuals. Yet, revenues from sales can be inclined to executive handling as directors sway credit provisions to stimulate sales. For that reason, Dechow et al (1995) add to the power of Jones model by subtracting the growth of accounts receivable from the growth of revenues to take into consideration potential credit terms usage by company executives.

To employ the modified Jones representation in a cross-sectional setting, we determine the model annually for all entities in equivalent 2-digit SIC industry as the newly listed corporation. However, we leave out companies launching IPOs in a three year period:

$$\frac{TACC_{i.t}}{TA_{i,t-1}} = \beta_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{PPE_{i.t}}{TA_{i,t-1}} + \varepsilon_{i,t} \qquad (1)$$

In this specification, TACCi,t stands for total accrual level reckoned as earnings prior to extraordinary items plus discounted operations minus cash inflows from operations; TAi,t-1 is total assets of the previous fiscal period; ΔSales is the disparity of the full amount of sales from the year preceding the offering till the first day of trade and PPEi,t stands for the total value of property plant and equipment. In this study we follow the cash flow approach as a replacement for the bottom line method as Hribar and Collins (2002) illustrate that when accrual measurement comes straight from cash flow reports

the non-enunciation issue of the balance sheet process is effectively tackled. Further, the entire set of our parameters is winsorized the 1% and 99% echelon to ensure that extreme values do not affect our estimations. Additionally, we allow for no less than 10 companies in a particular industry in a given fiscal period in order to run our regression analysis. Following the example of DeFond and Jiambalvo (1994), we rest upon this cross sectional methodology to control for intra-industry variations of fiscal activity across different years. As the same study suggests, a volatile financial environment could exert strong impact on the ultimate level of accruals extraneously of any intentional executive handling. We utilize estimated coefficients from specification (4) to approximate the projected element of the full amount of accruals (NACCi,t) for our comprehensive sample in the subsequent manner:

$$NACC_{i.t} = \hat{\beta}_0 \frac{1}{TA_{i,t-1}} + \hat{\beta}_1 \frac{\Delta SALES_{i,t} - \Delta REC_{i.t}}{TA_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i.t}}{TA_{i,t-1}} \quad (2)$$

Where ΔRECi,t stands for the difference in receivables between the year preceding the IPO and the listing year. Then we measure irregular accruals by subtracting total from projected accruals:

$$DACC_{i,t} = \frac{TACC_{i,t}}{TA_{i,t-1}} - NACC_{i.t} \quad (3)$$

The use of Jones model to estimate nonstandard accruals is subject to considerable criticism by experts on the field. As this approximation method highly correlates to corporate performance, the Jones formula can produce unreliable results when the sample includes firms exhibiting atypical performance (Dechow et al 1995). To alleviate this setback we follow the methodology Kothari et al. (2005) put forward. This involves matching the nonstandard accruals of our sample IPOs to those of non-listed entities (belonging to identical 2-digit SIC industries at the same fiscal period) with the most contiguous previous year ROA. New listings with corresponding non-IPO companies which encompass ROA ranges out of a plus/minus 10% of their matched counterparts are also eliminated. The unlisted entities' irregular accruals are subtracted to those of our sample firms to generate performance coordinated nonstandard accruals of the offerings under investigation.

Furthermore, we take into consideration that accrual approximation methodologies might not sufficiently segregate abnormal from projected accruals. Consequently, anticipated irregular accruals could as well include projected components. Nevertheless, we point out that nonstandard accruals in our analysis constitute the dependent variable. In this case,

the brunt of measurement slip-up is not as much prevalent as it is in explanatory parameters. Even if a certain extent of measurement error is present in our accrual estimation approach, this will result in a relative reduction of the model's explanatory power. Yet, we anticipate unbiased expected coefficients along bigger standard errors which eventual leads to extended intervals of confidence.

5.5.2 Real treatment of earnings

To surrogate for EM from real activities, we rely on the methodology recommended by Dechow et al (1998). Roychowdhury (2006) also rests upon this model that later becomes a very powerful tool in this area of accounting literature (Cohen et al 2008, Cohen and Zarowin 2010, Zang 2012, Alissa et al 2013). In particular, Roychowdhury (2006) suggests that executives habitually circumvent the documentation of yearly income losses by various means of real activity handling. Such manipulation schemes usually entail price markdowns or moderate credit conditions aiming to short-term augmentation of sales. Furthermore, excess production which brings down the cost of goods sold as well as diminution of discretionary expenses constitute alternative routes to real treatment of earnings. Thus, when operating pronouncements involve managerial judgment associated to production and level of sales; a three-fold outcome is expected. Namely, the company is likely to display abnormally stumpy echelon of cash flows from operations and provisional expenses but peculiarly lofty cost of production. In our analysis, we approximate real EM in three different ways: nonstandard operating cash flows, irregular costs of production and atypical discretionary expenditures.

The usual amount of operating cash flows articulates as a linear relation of sales and sales difference for the present fiscal interlude:

$$\frac{CFO_{i,t}}{TA_{i,t-1}} = \beta_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{SALES_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

In specification (8) CFOi,t stands for cash flows from operations, TAi,t-1 represents total assets from the previous period, SALESi,t corresponds to total sales and lastly ΔSALESi,t denote sales difference between the IPO year and the year before.

Likewise, our proxy for standard costs of production depends on the level of current sales as well as on its change both for current and past periods:

$$\frac{PROD_{i,t}}{TA_{i,t-1}} = \beta_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{SALES_{i,t}}{TA_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \beta_3 \frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{i,t} \quad (5)$$

In this function PRODi,t, stands for costs of production projected as the summation of costs of goods sold and the inventory difference between the listing year and the prior fiscal interval. ΔSALESi,t-1 signifies difference in sales between the fiscal period two years before the offering and the immediate year preceding the IPO.

Also, standard provisional expenditures are determined by the following approximation:

$$\frac{DISEXP_{i,t}}{TA_{i,t-1}} = \beta_0 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{i,t} \quad (6)$$

In which DISEXP signifies provisional expenditures estimated as the summation of selling, general and administrative expenses along with R&D and the cost of advertisement. Further, SALESi,t-1 corresponds to lagged total sales.

Invariably, specifications (8), (9) and (10) follow a cross sectional approximation manner for all years and industries with a minimum of ten observations. As always winsorization of all parameters at the 99% and 1% level restrains the impact of outliers on our analysis. The nonstandard echelon of all real EM proxies results from the difference between actual and ordinary levels as they arise after the deployment of coefficients in models (8), (9) and (10). Akin to accrual focused earnings handling approach, we align real EM proxies for the IPOs under investigation to those of their non-listed counterparts according to industry, fiscal period and ROA. This way we create performance harmonized real EM gauges. Moreover, we should mention that nonstandard operating cash flows and irregular provisional expenditures are multiplied by negative unity in order for higher values to mirror stronger earnings boosting tactics stemming from real activity treatment. Apart from scrutinizing the distinct impact of separate real EM policies, we further assess the amassed outcome of the three proxies combining REMGT-1 and REMGT-2. As Cohen and Zarowin (2010) suggest, we define REMGT-1 as the summation of nonstandard costs of production and irregular discretionary expenditures. Similarly, REMGT-2 represents the addition of atypical operating cash flows to the total amount of provisional expenses. At this point, we should notice that nonstandard operating cash flows and costs of production further generate reduced irregular cash surge from operations. Thus, a possible summation of these two parameters will eventually lead to double inclusion (Roychowdhury 2006, Cohen and Zarowin 2010). Intuitively, elevated REMGT-1 incentivizes companies to boost production levels and bring down provisional expenditures to handle earnings aloft. Equally, augmented REMGT-2, spurs firms to stage-manage sales and lessen flexible expenses.

5.6 Methodology

To recount the association of political contributions with EM, we denote the subsequent regression model:

$$Earnings\ Management_i = a + \beta_i X_i + \ \gamma\ PMC_i + \varepsilon \qquad (7)$$

The dependent variable in this approximation corresponds to the absolute value of a series of EM proxies employed in our analysis. Specifically, we utilize six different experimental parameters (abnormal accruals, discretionary expenses, cash from operations, costs of production along with REMGT-1 and 2) to fully investigate the effect of PMC on various earnings handling methods. Further, in specification (7): Xi comprises a vector of IPO-and company- specific traits, PMC goes into the model as a binary indicator and ε is the disturbance term.

At the outset, we perform our empirical analysis in a multivariate OLS regression context. Under this setting, coefficients can be reliable only if the predicted value of "γ" is free from self-selection bias and so uncorrelated with the residual component (Cov(PMC, ε)=0). However, the decision on whether firms should direct corporate funds to political pockets is exclusively determined by the company's top-management. It is reasonable to presume that directors will authorize PMC spending merely if they expect gains from connections to overshadow the cost of this investment. If that is true, our special sample of interest is not randomly determined and feedback effects could cripple the empirical output.

In his seminal study, Heckman (1979) maintains that endogeneity resembles in essence the problem of omitted variables and puts forward a two stage modus operandi to effectively address it. Adopting this approach, we identify a selection equation which estimates the probability of a company engaging in either lobbying or PAC donations:

$$\mathrm{PMC}_i^* = \ \delta U_i + k_i \qquad (8)$$

Where: $$\mathrm{PMC}_i = \begin{cases} 1, \ if\ \ \mathrm{PMC}_i^* > 0 \\ 0, \ if\ \mathrm{PMC}_i^* \leq 0 \end{cases}$$

In specification (8) PMCi signifies a hidden variable, U a vector of quantifiable determinants of political donations, δ an array of coefficients to be predicted and κ is the error term. This study pays special attention to the estimation method that best fits our analysis as statistical independence of the main explanatory variable could hardly be justified. Corporations which position the regulatory cadre amongst their major operational threats tend to sanction political money disbursements. Further, unobservable PMC factors such as the company's existing channels to congress chambers and openness to the institutional agenda are anticipated to exert influence on the reporting quality of financial information. The extent to which directors' feel vulnerable to the lawmaking outline could affect the accuracy by which key accounting figures are displayed. Thus, we foresee these parameters infiltrating specifications (7) and (8) via disturbance terms (ε and κ) and stimulating concerns for possible self-selection bias. Under a corporate finance framework, Cohen (2003) applies the Heckman two-stage approach to effectively cope with the endogenous character of a dichotomous independent variable which denotes reporting quality. Similarly, An and Chan (2008), follow exactly the same methodology for management's choice to secure credit rating before the firm goes public. In this study we also apply this econometric intuition in order for our estimated coefficients to be free from feedback effects.

5.7 Empirical Results

To ascertain that multicollinearity does not cripple our empirical output, we carry out pairwise-correlation checks for all parameters that enter the regression specifications. In addition, we apply the variance inflation factor (V.I.F.) examination to probe whether the variance of each variable bumps up as a result of its inter-reliance with other estimators. This procedure confirms that VIF stays reasonably low (below 5 across all different approximations). Regarding our suspicion for self-selection bias, the Durbin-Hu-Hausman test discards the assumption of exogeneity and corroborates the deployment of two-stage treatment effects approach. Finally, industry and year fixed effects are also taken into consideration in our analysis as latent clustering of new equity issues could subvert the consistency of findings.

5.7.1 Likelihood of PMC engagement

The aforementioned approximation approach congregates in a probit specification that estimates the chance of firm's decision to authorize transfer of corporate money to politics. At this stage of our analysis, we present an array of possible incentives for PMC expenditure and demonstrate first empirical outcome in Table 3. All of these parameters are explained in the subsequent section. This probit model generates a pseudo-R2 of 22.5%

5.7.2 Company visibility

As we observe from our preliminary analysis, commitment to political contributions characterizes entities that are considerably large. Master and Keim (1985) claim that the amount of total assets underpins the ability of corporations to scrutinize policy associated matters as well as the institutional setting. Additionally, Hart (2001) supplements this notion with evidence that relates gains from PMC donations to company size. Further, bigger firms have the capacity to allocate this expense across a broader asset scale. Correspondingly, elevated cash flow levels surrogate for the ease of resources use. Master and Keim (1985) provide and interesting insight to this issue by pointing out that even though non-financially constrained firms usually spend more on PMC; flourishing business prefer to desist such expenditure so as to elude unnecessary political notice. Firm age also enters the first stage equation as older companies are more apt to the establishment of connections on a continuing pattern. Finally, following the example of Skaife et al (2013) we incorporate in our analysis analyst coverage. Taking into account disclosure shortage in the period preceding the first day of trade, analyst documentation appraises the corporation's reliance on institutional frame and draws on potential threats ahead of the usual risk factor section on IPO prospectuses.

Coefficients of the selection equation verify that cash affluent and bigger companies are more probable to allow spending for political coffers. Also, substantiating our final inference, analyst coverage is also positive and statistically significant at the 1% level. On the other hand, firm age does not qualify as an important determinant of PMC spending.

5.7.3 Inner Politics

Researches indicate numerous managerial features that are unswervingly predisposed by the directors' political perspective. For instance Chin et al (2013) advocate that North American companies with conservative CEOs, after a period of mediocre performance, restrict corporate social responsibility plans. Broadening their investigation to political money contributions, they document that conservative executives tend to donate corporate funds to Republican candidates. However, Hart (2001) points out that further firm insiders (i.e. major stockholders) are also provoked by their own political aspirations and contend top management for the allocation of existing PMC cremations. Therefore, in-house politics constitute an extra imperative factor of political disbursements. In our analysis, this element goes into the first stage specification by means of pre IPO equity, concentration of ownership (according to the HHI index) as well as the fraction of union member employees in the company's industry. In addition, following Zardkoohi (1985), we take into consideration that entities operating in industries with high PMC involvement may as well influence executives to mimic competitors and try to build political networks. Hence, the parameter PMC industry denotes the number of business in the same four-digit SIC code industry that exhibit a record of contributions. Finally, we include a binary variable to denote the presence of venture capitalists in the going public process so as to account for the extensive pressure VCs exert on potential new issuers. Reasonably, someone might argue that less senior VCs, in an effort to boost their reputation could rely on contributions to demonstrate strong affiliation with policy makers.

The estimated coefficients of the selection equation verify that the likelihood of donating money to politics augments with the concentration of ownership in addition to the amount of equity prior to the listing (at the highest level of significance) and the extent of political engagement of companies in the same industry. Further, the same holds true for VC existence (at the 5% level). Venture capitalists seem to identify, as a minimum, certain gains in PMC lining up, with the central supposition of this research. In contrast, the proportion of union-member employees in the industry does not yield statistically significant results.

5.7.4 The impact of PMC on earnings management

Table 5, exhibits empirical output on the influence contributions exert on EM practices for the comprehensive sample of new equity offerings (N=2,104). To verify the robust nature of results, we chart three different approximation techniques; Heckman two-stage approach, maximum likelihood estimation of treatment effects and the instrumental variables method. The dependent variable is the absolute value of all our EM proxies as explained in the methodology section. Further, in specification (1) we consider as control variables a set of company attributes that could also affect the EM echelon. Namely, we include:

Firm age. This variable stands for the natural logarithm of years elapsed from the corporation's founding until the first trading day. Entities that sustain operations for longer time interludes build up concrete administrative and accounting structures. Conversely, younger businesses frequently exhibit worse financial output and unsteady cash inflows; hence, the enticement to handle earnings is stronger. Furthermore, we take into consideration the effect of company's size incorporating in our analysis the logarithmic transformation of market value. Intuitively, bigger corporations operate on more complicated financial frameworks which induce top management to apply judgment over accounting guidelines in order to treat income favorably. Yet, it is also true that larger entities have to cope with intense monitoring from regulatory bodies and market participants. This certainly discourages directors' intension to emasculate the accuracy of key accounting figures (Lee and Masulis 2011).

Additionally, DeFond and Jiambalvo (1994) present evidence of income augmenting EM practices in the fiscal period preceding debt contract infringement by the company. This implies that exceedingly geared entities are inclined to handle the level of accruals so as to elude credit agreement contraventions. Similarly, Franz et al (2014) confirm that corporations near to debt contract breach are more susceptible to manipulate earnings than businesses afar potential credit-term defiance. To this end, we add the parameter leverage to our analysis to account for the prospect of intentional financial misreporting by largely geared firms. In addition, Burgstahler and Dichev (1997) maintain that companies stage-manage income to steer clear of losses. In the same line of thought, Degeorge et al (1997) posit that top managers take on EM tactics to surpass the agreed profit targets. Thus, the variable loss controls for the likelihood of income boosting strategies by corporations which incur losses.

Earlier research suggests that financial mediators which facilitate the going public courses of action could also hold back EM initiatives. Jo et al (2007) claim that manipulation of earnings around seasoned equity offerings, is considerably smaller in cases where prominent underwriters monitor the process. Correspondingly, Lee and Masulis (2011) document an inverse relation between the prestige of the investment banker and EM by new equity issuers. For that reason, we incorporate in our empirical approach the variable underwriter rank to recognize the impact of top echelon intermediaries. Additionally, the parameter Auditor-6 enters our regression model to confine the capacity of highly skilled auditing companies to spot distortions of key accounting figures reported by firm executives (Krishnan, 2003; Gul et al., 2009). Moreover, the binary indicator Vent Cap accounts for the aptitude of VCs to curtail EM via their monitoring function (Morsfield and Tan 2006; Lee and Masulis 2011; Hochberg 2012; Wongsunwai 2013).

Further, it is also true that outside market players may be challenged to accurately valuate rapidly growing entities. This is due to the fact that the value of these corporations is drawing from tentative prospects for future growth and directors are likely to delude shareholders via treatment of earnings (Fan 2007). To account for growth projections we rely on the mean capital expenditure (Cap. Exp) at the IPO year and the following fiscal period weighted by total assets at the commencement of the issuing year. In addition, industry-accustomed return on assets (ROA) is an extra proxy for corporate output.

Consistently, the three approximation methods presented in table 5, produce positive and statistically significant coefficients (either at the 1% or 5% level of confidence) for our PMC indicator. Even though we are not in a position to utterly discard different elucidations for this positive relation between political contributions and EM, findings align with our initial supposition that connected newly listed corporations are more probable to participate in earnings handling tactics. Furthermore, we should notice that results relating to the vector of control variables, line up in general with existing literature. In particular, we report that IPO firms which are younger, more geared, more profitable, with low levels of capital expenditures and without VC backing are more likely to engage in EM. Noticeably, the PMC industry indicator in our selection equation is positive and significant at the 1% level of confidence. This strong statistical association sides with prior evidence (Zardkoohi 1985) that entities operating in sectors dominated by companies with sturdy political ties, choose to act in a similar vein.

In table 6, we present multivariate regression analysis on the association of various proxies of real earnings management handling and PMC spending. Specifically, we rely on a Heckman two-stage treatment effects model to effectively cope with feedback effects arising from the fact that the decision to direct corporate funds to political pockets is endogenously determined. The Inverse Mills ratio for each specification is also reported and justifies our choice to employ this approximation method.

Invariably, results across five different regression models substantiate the initial conjecture that political connections emasculate top-management's commitment to high-quality income reporting practices. On the whole, every real EM metric (non-standard cash flows from operations, irregular costs of production, non-standard discretionary expenses as well as joint real activity EM gauges REMGT-1 and REMGT-2) exhibits strong and positive impact on the response variable. These empirical findings shore up the assumption that connected IPO companies are further prone to stage-manage real activities in order to inflate earnings. Also, the set of control indicators maintains the sings predicted by extant literature. Particularly, we report that constraints in liquidity along with high debt and capital expenditure levels significantly augment the likelihood of real EM. On the contrary, entities which are older with venture capital backing and under the presence of prestigious underwriters, display considerably lower levels of real activities handling. In general, it becomes apparent that both accrual and real EM tactics bracket together with corporations that retain a record of political endowments. Econometric analysis, at this stage, designates that PMC spending weakens the accuracy of income reporting practices.

Taking an extra step in our analysis, we also concentrate on the special sample of interest which consists of 286 politically connected IPO firms. This is to gauge the actual impact of the level of political contributions (measured in dollars) instead of just the existence of a PMC record, on earnings management schemes. Maintaining the same set of control variables as hitherto, we employ as main explanatory indicators "PAC donations" (Panel A, in table 7) and also "lobby disbursements" (Panel B, in table 7) to home in on lobbyist new equity entities. In line with what we document so far in our empirical investigation, the coefficients of these variables retain their positive and statistically significant association with all different EM metrics. Both PAC and lobby money exert strong influence on accrual and real activities handling, confirming this way

the conjecture the amount of cash spend for the establishment of political ties inversely relates to the top-management's obligation to deliver accurate income estimates.

5.8 Conclusion

This research presents new empirical findings on the association of political money contributions on EM at the time of new equity issues. In particular, we document that IPOs with an established PMC record actively engage in earnings manipulation during the listing year. Accounting literature advocates that favourable treatment of income can lead to an increase of short-term share prices. Consequently, the incentive to inflate profits in the prospect of an initial offering becomes even stronger for firm executives. Taking into consideration, evidence on the positive impact of connections on corporate performance of listed entities and motivated by the fact that PMC influence on the going public process remains a relatively unexplored area; we seek to answer whether contributions undermine the accuracy of earnings estimations. Our main conjecture is that top-management exploits benefits from its political capital and becomes impassive to investor demands for precise reporting of income. Further, we investigate if different PMC types as well as their magnitude can stimulate profit manipulation. Results confirm our supposition that PMC-IPOs tend to stage-manage accounting information and higher levels of corporate spending in politics associate with higher EM.

To test our assumption we rely on comprehensive and large sample of IPOs that floated the US stock exchanges over the period January 1, 1998 to December 31, 2014. After the application of all required restrictions we end up a final sample of 2,104 newly listed firms and manually we investigate each one of them for PMC evidence. Our enquiry enabled us to identify 286 politically connected issuers.

Methodologically, we scrutinize both accrual focused EM along with real activities manipulation. In particular, to measure the usage of accruals by new issuers, we base our analysis on the modified Jones (1991) model. Accordingly, in order to surrogate for real activities EM, we calculate three distinct proxies executives could use to inflate earnings (provisional expenses, production and sales) in conjunction with another two joint metrics that capture the concurrent practice of various real EM schemes. Furthermore, we adjust for feedback effects arising from the notion that IPO firm managers self-select themselves into the PMC practice. Our results are robust across three

different econometric approaches (OLS, Heckman two-stage treatment effects model, instrumental variables (IV)) and verify that connected issuers habitually engage in opportunistic income handling tactics to facilitate a successful first trading day.

Appendix A: Variables Definitions

Variable Name	
Panel A: Earnings Management Variables	
Non-Standard Accruals	Non-Standard Accruals as calculated using the methodology proposed by Kothari et al (2005). We estimated the discretionary accruals using the modified Jones model (1991)
Non-Standard cash flows from operations	Non-Standard cash flows from operations were calculated using the proposed methodology of Roychowdhury (2006)
Non-Standard provisional expenses	Non-Standard discretionary expenses were calculated using the proposed methodology of Roychowdhury (2006)
Non-Standard costs production	Non-Standard costs of production, where costs of production represent the sum of costs of goods sold and change in inventories
REMGT-1	Estimate of real earnings management, calculated as: REMGT-1 = Non-Standard production costs - Non-Standard discretionary expenses
REMGT-2	Estimate of real earnings management, calculated as: REMGT-2 = Non-Standard cash flow from operations - Non-Standard discretionary expenses
Panel B: Political Contribution Variables	
PMC	Defined as a dummy variable, with 1 representing IPOs with lobbying or PAC contributions
PAC	Set as the natural logarithm of total dollar contributions towards candidates in the election cycle most closely to the IPO (cutoff set at 5 years).
Lobby Money	The natural logarithm of total lobbying dollars in the year most closely preceding the IPO (cutoff set at 5 years).
Panel C: Instrumental Variables	
Analyst Coverage	Dummy variable set as 1 for IPOs within the top 25th percentile of results returned by the LexisNexis database in the year prior to PMC, else 0
Union membership	The percentage of employees who are part-taking in labour unions, industry-wide (at the 4-digit level of SIC code), as defined by Hirsch and Macpherson (2003)
Ownership Concentration	The Herfindahl -Hirschman index (HHI) of ownership concentration. Hand-collected data from IPO prospectuses were used in the creation of the index
PMC Industry	The number of firms, involved in PMC, in the 4-digit industry
Cash flow	The natural logarithm of net income before extraordinary items plus depreciation and amortization minus dividends on common and preferred stock. The data comes from the last fiscal year prior to IPO with all amounts in millions of dollars.

Pre-IPO-mgt ownership	Percentage of total shares held by executive officers & directors prior to IPO, with data collected directly from IPO prospectuses.
Assets	The book-value of company assets in millions of USD.
	Panel D: Firm Characteristics
Ln(sales)	The logarithm of net sales in the year preceding the IPO
Ln(age)	The logarithm of one plus age. Age is the difference between the firm's IPO year and its founding year. We collected the founding years from the Field-Ritter database.
Leverage	The ratio of total liabilities to total assets in the fiscal year prior to IPO
Losses	Dummy variable set as one for firms with EBIT in the fiscal year preceding the IPO, zero otherwise
Capital expenditures	The mean capital expenditure in the IPO year and one year after scaled by assets at the commencement of the listing year
Industry-accustomed ROA	Industry-adjusted ROA calculated by subtracting mean ROA of the two-digit SIC industry group from the firm's ROA
Auditor-6	Dummy variable set as 1 for firms audited by the six largest audit firms, zero otherwise. These audit firms include Arthur Andersen, Coopers & Lybrand, Ernst & Young, Deloitte & Touche, KPMG and PricewaterhouseCoopers
Venture Capital	Dummy variable set as 1 for venture backed firms, zero otherwise
Underwriter-rank	Dummy variable set as 1 for firms underwritten by most reputational underwriters, otherwise zero. Most reputational underwriters are those with ranking score of 9.0 or above based on Jay Ritter's underwriter rankings
Market Value	The natural logarithm of total market value at the time of the listing

Table 1: Summary statistics

The table reports summary statistics for a sample of new equity issues that floated the US stock exchanges from 1st January, 1998 to 31st of December 2014. The distribution of IPOs across industries as well as preliminary analysis of key firm characteristics (firm age, company proceeds, total assets, sales revenue and market value) are presented both for the entire sample and for the companies with and without an established PMC record. All variables are defined in the Appendix.

	Full sample (N=2,104)		IPO firms with PMC (N=286)		IPO firms without PMC (N= 1,818)	
SIC INDUSTRY	N	%	N	%	N	%
Agriculture, forestry and fishing	12	0.57	1	0.35	11	0.60
Construction and mining	85	4.03	16	5.59	69	3.79
Manufacturing industries	639	30.37	99	34.61	540	29.70
Transport., commun., utilities	231	10.97	37	12.93	194	10.67
Retail and wholesale trade	237	11.26	16	5.59	221	12.15
Finance, real estate and insurance	198	9.41	43	15.03	155	8.52
Service industries	696	33.08	74	25.87	622	34.21
Public administration	6	0.28	0	0.00	6	0.33
		100%		100%		100%

	MEAN	MEDIAN	MEAN	MEDIAN	MEAN	MEDIAN
Firm Age	17.06	10.00	15.24	9.00	35.76	25.00
Company proceeds (in million $)	86.16	42.90	348.87	142.44	69.82	41.83
Total assets (in million $)	321.71	76.98	2,188.35	687.22	202.61	71.02
Sales revenue (in million $)	298.01	57.25	2,106.92	545.39	185.57	52.09
Total market value (in million $)	548.52	183.88	2,025.31	606.42	465.44	165.98

Table 2: Descriptive statistics

The table documents descriptive statistics for IPO and firm specific characteristics in addition to six different earnings management metrics for a sample of US new equity firms announced from 1st January 1998 to 31st December 2014. The descriptive statistics on this table refer both to the entire sample and to the special sample of IPO firms with an established PMC record. All variables are defined in the Appendix. T-tests and Wilcoxon sign rank tests are employed to check mean and median differences from zero. *,**,*** indicate statistical significance at 10%,5% and 1% confidence level respectively.

	Full Sample (N= 2,104)			IPO firms without PMC (N= 1,818)			IPO firms with PMC (N= 286)				
	N	Mean	Median	N	Mean	Median	N	Mean	Median	Mean difference (p-value)	Median difference (p-value)
IPO and company characteristics											
Ln Firm age	2,104	1.04	1.04	1,818	1.39	1.40	286	1.02	0.96	0.000	0.000
Ln Market value	2,104	5.28	5.28	1,818	5.20	5.15	286	6.35	6.21	0.000	0.000
Leverage	2,104	0.82	0.82	1,818	0.71	0.68	286	0.99	0.88	0.000	0.000
Losses	2,104	0.39	0.39	1,818	0.09	0.00	286	0.40	0.00	0.000	0.000
Underwriter-rank	2,104	0.37	0.37	1,818	0.69	1.00	286	0.35	0.00	0.000	0.000
Auditor-6	2,104	0.95	0.95	1,818	0.96	1.00	286	0.92	1.01	0.041	0.072
V.C.	2,104	0.52	0.52	1,818	0.56	0.00	286	0.19	1.01	0.000	0.000
ROA industry accustomed	2,104	-0.18	-0.18	1,818	-0.19	-0.01	286	-0.03	-0.01	0.000	0.443
Cap. Exp.	2,104	0.43	0.43	1,818	0.44	0.15	286	0.13	0.07	0.121	0.000
Proxies of Earnings Management											
Non-standard accruals	2,104	-0.04***	0.03***	1,818	-0.05	-0.02	286	-0.02**	0.02***	0.490	0.059
Non-standard operating cash flows	2,104	0.11***	0.04***	1,818	0.00	0.03	286	0.09***	0.02***	0.053	0.176
Non-standard costs of production	2,104	-0.12***	-0.09***	1,818	-0.02	-0.02	286	-0.11***	-0.08***	0.108	0.009
Non-standard provisional expenses	2,104	-0.74***	-0.32***	1,818	0.03	0.03	286	-0.68***	-0.28***	0.000	0.000
REMGT-1	2,104	-0.82***	-0.33***	1,818	0.07	0.09**	286	-0.87***	-0.39***	0.000	0.000
REMGT-2	2,104	-0.58***	-0.24***	1,818	0.03	0.02	286	-0.58***	-0.23***	0.000	0.000

Table 3: Correlation matrix

The table reports pairwise correlations for the variables included in our analysis. The results refer a sample of new equity issues that floated the US stock exchanges from 1st January, 1998 to 31st of December 2014.

	PMC and Firm Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*
1.	PMC														
2.	PAC Money	0.32													
3.	Lobby Money	0.27	0.25												
4.	Leverage	-0.38	-0.33	-0.17											
5.	Loss	-0.17	0.31	-0.31	-0.27										
6.	ROA	-0.22	0.32	-0.42	-0.19	0.19									
7.	Cash flow	0.51	0.08	-0.34	-0.22	-0.21	0.33								
8.	Industry adjusted ROA	-0.24	0.12	0.46	0.18	0.20	0.14	0.02							
9.	Interest Coverage	0.11	-0.16	0.08	-0.17	-0.21	-0.16	0.13	-0.35						
10.	Big6 Auditor	-0.04	0.01	0.19	0.35	0.15	0.02	0.21	0.25	-0.26					
11.	Assets	0.17	0.17	-0.31	-0.19	0.17	0.18	0.17	0.37	-0.45	0.09				
12.	High ranked Underwriter	-0.36	0.29	0.25	-0.32	-0.22	0.21	0.24	0.14	-0.29	0.15	0.33			
13.	VC	0.27	0.32	0.48	-0.21	0.14	0.17	0.17	0.18	-0.17	0.12	0.24	0.39		
14.	Log (sales)	0.29	0.06	0.22	0.59	0.28	0.14	0.54	0.31	0.19	0.27	0.31	0.42	0.23	
15.	Log (age)	0.41	0.05	0.12	0.44	0.16	0.07	0.03	0.11	0.21	0.32	0.28	0.16	0.05	0.37

Table 4: Determinants of the likelihood of political contributions by new issuers

This table presents the outcome of a probit specification for the likelihood of PMC engagement on a set of acknowledged contribution determinants. The sample contains 2,104 new equity issues that floated the US stock exchanges during the period 1 January, 1998 to December 31st 2014. Column 1, reports the estimated coefficients and column 2, the Z-statistics. Appendix A, provides detailed definitions of all variables. Symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively

	Coefficient	Z-statistic
Company visibility		
Total assets	0.358***	7.82
Firm age	-0.019	-0.42
Cash flows	0.053*	1.91
Analyst coverage	0.411***	4.58
Inner politics		
VC	0.174*	1.65
Concentration of ownership	0.681***	5.32
Pre IPO equity	0.915***	8.29
Union membership	-0.103	-0.18
PMC industry	0.359***	3.35
N		2,104
Pseudo-R^2		0.225

Table 5: Impact of political money contributions on accrual based EM

The table presents empirical output on the relation between political money contributions and abnormal accruals for a sample of US IPOs over the period 1st of January, 1998 to 31st December 2014 using four different estimation approaches: OLS (column 1); Heckman two-stage treatment effect model (column 2); maximum likelihood treatment effect model (column 3) and instrumental variables model (column 4). All estimations control for fixed year effects with suppressed coefficients. Variables are defined in Appendix A. Symbols *, ** and *** denote statistical significance at the 1%, 5% and 10% levels respectively. In all estimations standard errors are adjusted for heteroscedasticity.

	OLS	Heckman	MLE	IV
PMC	0.038**	0.751***	0.394***	1.118**
	(2.07)	(2.68)	(3.47)	(2.12)
Ln Firm Age	-0.011**	-0.274***	-0.295***	-0.115*
	(-2.84)	(-3.11)	(-4.07)	(-1.89)
Ln Mkt Value	0.06	0.02	0.01	0.04
	(0.10)	(0.09)	(0.07)	(1.66)
Leverage	0.054***	0.098**	0.074*	0.122**
	(4.69)	(1.21)	(1.53)	(2.24)
Losses	0.012	0.063*	0.065*	0.075
	(1.25)	(1.89)	(1.68)	(1.59)
Underwriter-rank	-0.02	-0.022	-0.028	-0.019
	(-0.24)	(-1.11)	(-1.15)	(-0.32)
Auditor-6	-0.07	-0.023	-0.024	-0.029
	(1.03)	(0.59)	(0.58)	(0.61)
VC	-0.085**	-0.061**	-0.052*	-0.110**
	(-0.12)	(-2.05)	(-1.83)	(-2.44)
ROA industry-accustomed	0.009	0.004	0.001	0.002
	(0.29)	(0.03)	(0.01)	(0.05)
Cap. Exp.	0.092***	0.023***	0.022***	0.027***
	(3.74)	(3.78)	(3.57)	(3.77)
Inverse Mills Ratio		0..069***	-	-
		(1.92)		
N	2,104	2,104	2,104	2,104
R-squared (OLS)	0.25			

Table 6: Impact of political money contributions on real EM

The table presents empirical output on the association between political money contributions and real earnings management for a sample of 2,104 new equity offerings that floated the US stock exchanges over the period 1st of January, 1998 to 31st of December 2014. To effectively address the endogeneity concern we employ a Heckman two-stage treatment effect model. The inverse Mills ratio is also reported for each specification. All estimations control for fixed year effects with suppressed coefficients. Variables are defined in Appendix A. Symbols *, ** and *** denote statistical significance at the 1%, 5% and 10% levels respectively. In all estimations standard errors are adjusted for heteroscedasticity.

	Non-standard operating accruals	Non-standard costs of production	Non-standard provisional expenses	REMGT-1	REMGT-2
	(1)	(2)	(3)	(4)	(5)
PMC	0.603**	0.582**	0.786***	0.821**	0.914***
	(2.45)	(2.01)	(2.13)	(1.99)	(2.54)
Ln Firm Age	-0.238***	-0.046	-0.067	-0.082	-0.051
	(-3.02)	(-0.53)	(-1.39)	(-0.77)	(-0.73)
Ln Mkt Value	0.009	0.062*	0.028	0.223***	0.031
	(0.38)	(1.58)	(1.39)	(2.77)	(1.11)
Leverage	0.091**	0.028	0.322**	0.042	0.184***
	(2.41)	(0.35)	(2.50)	(0.39)	(2.96)
Losses	0.111**	0.098	0.069	0.019	0.018
	(2.09)	(1.04)	(1.23)	(0.12)	(0.15)
Underwriter-rank	-0.095**	-0.079	-0.148***	-0.108	-0.162***
	(-2.23)	(-1.25)	(-2.68)	(-1.27)	(-2.71)
Auditor-6	0.034	0.162	0.058	0.167	-0.031
	(0.35)	(1.44)	(0.77)	(1.18)	(-0.23)
VC	-0.078*	0.008	-0.041	-0.073	-0.048
	(-1.69)	(0.11)	(-0.65)	(-0.55)	(-0.97)
ROA industry-accustomed	-0.938***	-0.889***	-0.375***	-0.466***	-0.325***
	(-4.67)	(-4.06)	(-3.42)	(-2.89)	(-3.68)
Cap. Exp.	0.019***	0.266***	0.009	0.298*	0.039***
	(3.44)	(3.45)	(0.19)	(1.79)	(2.92)
Intercept	0.322**	0.567	0.187	1.352***	0.373
	(1.44)	(1.48)	(1.32)	(2.99)	(1.33)
Inverse Mills ratio	0.193*	0.431*	0.285**	0.412*	0.447**
	(1.82)	(1.86)	(2.34)	(1.84)	(2.21)
N	2,104	2,104	2,104	2,104	2,104

Table 7: Impact of PMC level on earnings management

The table presents results of OLS cross-sectional regression analysis of earnings management on PMC level measured by PAC imbursements (PANEL A) and lobby payments (PANEL B). The sample consists of newly listed firms which actively engage in PMC spending over the period 1st January, 1998 31st December, 2014. All estimations control for fixed year effects with suppressed coefficients. Variables are defined in Appendix A. Symbols *, ** and *** denote statistical significance at the 1%, 5% and 10% levels respectively. In all estimations standard errors are adjusted for heteroscedasticity.

PANEL A: The association between PAC-money and earnings management

	Non-standard accruals	Non-standard operating accruals	Non-standard costs of production	Non-standard provisional expenses	REMGT-1	REMGT-2
PAC-money	0.895**	0.989*	-0.974**	1.562***	0.921*	2.173**
	(2.01)	(1.91)	(-1.88)	(2.65)	(1.71)	(2.34)
Ln Firm Age	-0.104*	-0.142*	-0.048	-0.051	-0.145	0.022
	(-1.61)	(-2.35)	(-0.51)	(-0.64)	(-1.38)	(0.25)
Ln Mkt Value	0.035	0.051	0.072	0.086**	0.029	0.148**
	(1.49)	(1.53)	(1.45)	(2.38)	(0.42)	(2.44)
Leverage	0.144***	0.077	0.145	0.268**	0.058	0.284**
	(2.82)	(1.58)	(1.38)	(2.16)	(0.47)	(2.41)
Losses	0.035	0.023	0.047	0.006	0.046	-0.019
	(1.03)	(1.14)	(0.42)	(0.12)	(0.23)	(-0.17)
Underwriter-rank	-0.005	-0.032	-0.128*	-0.031	-0.131	-0.027
	(-0.11)	(-0.83)	(-1.85)	(-0.38)	(-1.44)	(-0.30)
Auditor-6	-0.033	-0.021	-0.152	-0.163*	-0.209	-0.024
	(0.37)	(0.09)	(1.48)	(1.72)	(1.47)	(0.21)
VC	-0.109**	-0.112**	-0.055	-0.125*	-0.182	-0.250**
	(-2.51)	(-2.27)	(-0.65)	(-1.83)	(-1.29)	(-2.47)
ROA industry accustomed	0.071	0.914***	0.727***	0.405***	0.496***	0.196***
	(-1.45)	(-5.02)	(-5.88)	(-2.51)	(-3.44)	(-2.11)
Cap. Exp.	0.018**	0.015**	0.074	0.011	-0.361	0.035**
	(3.56)	(2.34)	(0.52)	(0.33)	(-0.28)	(2.81)
Intercept	0.128	0.479**	0.053	-0.204	0.525	0.008
	(0.49)	(2.03)	(0.14)	(-0.76)	(1.41)	(0.01)
N	96	96	96	96	96	96
R-squared	0.341	0.375	0.320	0.401	0.332	0.356

PANEL B: The association between lobby contributions and earnings management

	Non-standard accruals	Non-standard operating accruals	Non-standard costs of production	Non-standard provisional expenses	REMGT-1	REMGT-2
Lobby contributions	1.382**	1.537*	1.077*	2.135**	1.456**	3.542**
	(2.04)	(1.78)	(1.78)	(2.42)	(1.98)	(2.34)
Ln Firm Age	-0.112*	-0.091	-0.018	-0.062	-0.171	-0.018
	(-1.73)	(-1.26)	(-0.014)	(-0.85)	(-1.43)	(-0.15)
Ln Mkt Value	0.042	0.079	0.008	0.112**	-0.022	0.152**
	(1.36)	(1.37)	(0.19)	(2.32)	(-0.28)	(2.09)
Leverage	0.116**	0.135***	0.106	0.352**	0.173	0.524***
	(2.41)	(1.07)	(1.05)	(2.30)	(1.20)	(2.72)
Losses	0.088*	-0.148**	0.109	0.026	0.073	0.040
	(1.58)	(-1.99)	(1.06)	(0.22)	(0.32)	(0.31)
Underwriter-rank	-0.004	-0.015	-0.052	-0.015	-0.038	-0.092
	(-0.009)	(-0.27)	(-0.50)	(0,12)	(-0.29)	(0.48)
Auditor-6	-0.041	-0.055	-0.198*	-0.107	-0,178	-0.094
	(0.73)	(0.63)	(1.55)	(0.89)	(1.14)	(0.66)
VC	-0.137**	-0.179**	-0.127	-0.232**	-0.324*	-0.356**
	(-2.62)	(-2.72)	(-1.10)	(-2.32)	(-1.66)	(-2.45)
ROA industry accustomed	0.015	-0.731***	-0.561***	-0.272**	-0.276*	-0.127
	(0.28)	(-5.02)	(-3.98)	(-1.95)	(-1.64)	(-1.17)
Cap. Exp.	0.015***	0.019***	0.205**	-0.031	0.128	0.033***
	(3.67)	(2.84)	(2.18)	(-0.64)	(0.52)	(2.77)
Intercept	0.122	-0.035	0.512	-0.156	1.362	-0.343
	(0.71)	(-0.14)	(1.23)	(-0.87)	(2.67)	(-1.03)
N	258	258	258	258	258	258
R-squared	0,342	0,335	0,369	0,371	0,322	0,347

Chapter-6 Summary and Concluding Remarks

This chapter summarizes and evaluates the major findings of this thesis on mechanisms to mitigate issuer-specific uncertainty in the process of going public. Two of them, employing executives with top-notch educational backgrounds and pursuing credit ratings, are novel, cost-effective and easily-implemetable. Importantly, they do not intend to manipulate the investement decision unlike the prevalent practice of earnings management which is revisited and provided with new empirical evidence from the perspective of politically connected firms. Consequently,
an IPO sale needs not be framed in competitive terms as, upon appropriate planning, it can create value for both equity buyers and sellers.

At the first empirical chapter we scrutinize the educational background of the CEO as facilitating mechanism in the going process. Based on extant literature containing that high-potential individuals strive to signal their quality via rigorous education; we conjecture that uninformed outsiders could perceive highly trained CEOs as a valuable asset capable of leading the firm to a successful IPO. To our knowledge this is the first study that explicitly investigates Chief executive's attainments as means of lowering the amount of money left on the table at the first day of trade. Previous empirical proof is fairly limited to the context of mutual funds and appears to have reached the consensus that university education is positively related to innovative courses of action and distinguished financial performance.

After meticulous econometric analysis, results indicate that: 1) the acquisition of at least one university degree as well as the number of degrees earned associates with less underpricing. This certainly aligns with the fundamental notion of signaling theory that prestigious education constitutes a valid proxy for ability and reduces uncertainty for outside investors. 2) At the master's level, the MBA and MA degrees encompass the strongest impact on IPO performance. According to previous research, the first of these awards is well regarded by market players for its business-focused curriculum and the second is linked to individuals who are more likely to enforce strategic changes in their organizations. 3) CEOs with qualifications from US institutions perform better than those with international education in terms of underpricing. Additionally, executives who hold at least one graduate award from an Ivy League university significantly reduce the level of returns. The same conclusion holds for PhD graduates from the Nobel Elite group of colleges. 4) At the doctoral level of education, the Juris and Medical Doctor awards do

reduce the initial returns. On the contrary, the PhD is always insignificantly related to IPO performance unless it is awarded by the Nobel Elite group, as mentioned earlier.

The second empirical chapter constitutes the first attempt to explore the acquisition of multiple credit ratings as a means of reducing market uncertainty that always surrounds the issue of new equity. In particular, we establish evidence that prospective issuers who set up a record of ratings from the three largest U.S. credit rating agencies (Standard & Poor's, Moody's and Fitch) leave less money on the table at the first trading day. Being both traceable and also broadly available, a record of credit rating possession constitutes an effectual way via which information on the company's amplified risk bearing aptitude is communicated to outsiders. Accordingly, future investors of a new offer are more certain that the company will confront lower market frictions and as a result require lower premia in order to procure its equity. On this basis, the IPO firm can initiate operations as a public entity by incurring modest level of underpricing when it will enter a stock exchange for the first time.

This research posits that credit rating acquisition per se from the world's leading CRAs constitutes a valid proxy of firm quality as evidenced by the renowned short run performance of the rated IPOs. Consistently, ratings from all agencies display high and adverse impact on the level of initial returns. Based on this inference, we take an extra step to evaluate whether an equivalent pattern persists in the case of multiple ratings. To this end, we run a array of regression specifications that break down the effect of all likely groupings of rating agencies and we verify that multi-rated entities put in significantly to the alleviation of uncertainty in the going public process. This finding holds true both for double and triple rating possession. Furthermore, the grade level of the assigned ratings of each CRA, extra contributes to a successful first trading day. Our study offer proof in support of the view that higher ratings are rewarded to firms that investors identify as less dicey. At last, results reveal a fairly interesting phenomenon. That is to say, the facilitating character of credit ratings is also at hand in the price discovering process during the book building period. Robust econometric output shows that CRAs' evaluations consistently filing price revisions downwards.

Also, when levying on the fundamentals of rated IPOs, we detect that these offerings associate to superior quality as proxied by the degree of operational experience, market share, and the amount of proceeds raised. Overall, we uncover a strong and

statistically robust substantiation on the value adding character of CRAs to the IPO endeavor.

Our final empirical chapter renders new evidence on the relation of political money contributions (PMC) on earnings management (EM) practices at the time of new equity issues. In particular, we report that newly listed entities with an established PMC record actively engage in earnings manipulation during the year of the offering. Extant literature maintains that favorable handling of income results to relative increases of short-term share prices. Therefore, the enticement to raise profits in the view of an IPO turns out to be even stronger for top-tier management. Taking into account, existing proof on the positive influence connections exert on corporate performance of listed entities and motivated by the fact that PMC impact on the going public process remains a relatively unexplored area; we attempt to answer whether contributions undermine the accuracy of earnings estimations. Our main supposition is that high-ranked managers exploit gains from their political capital and become unresponsive to investor demands for clear-cut reporting of income. In addition, we inspect whether different PMC types as well as their magnitude can stimulate profit manipulation. Results corroborate our conjecture that PMC-IPOs are inclined to stage-manage accounting information and also that a higher level of corporate spending in politics associates with higher EM.

Econometrically, we investigate both accrual focused EM and real activities manipulation. Specifically, to gauge the misuse of accruals by issuers, we base our analysis on the modified Jones (1991) model. Accordingly, to proxy for real activities EM, we reckon three separate metrics executives could use to pump up earnings (provisional expenses, production and sales) in conjunction with another two joint proxies that capture the concurrent practice of various real EM schemes. Furthermore, we adjust for feedback effects arising from the notion that IPO firm managers self-select themselves into the PMC practice. Our results are robust across three different econometric approaches and confirm that firm outsiders and mainly investors and regulators should account for the fact that connections with Congress chambers could weaken management’s pledge to present accurate profit estimates

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